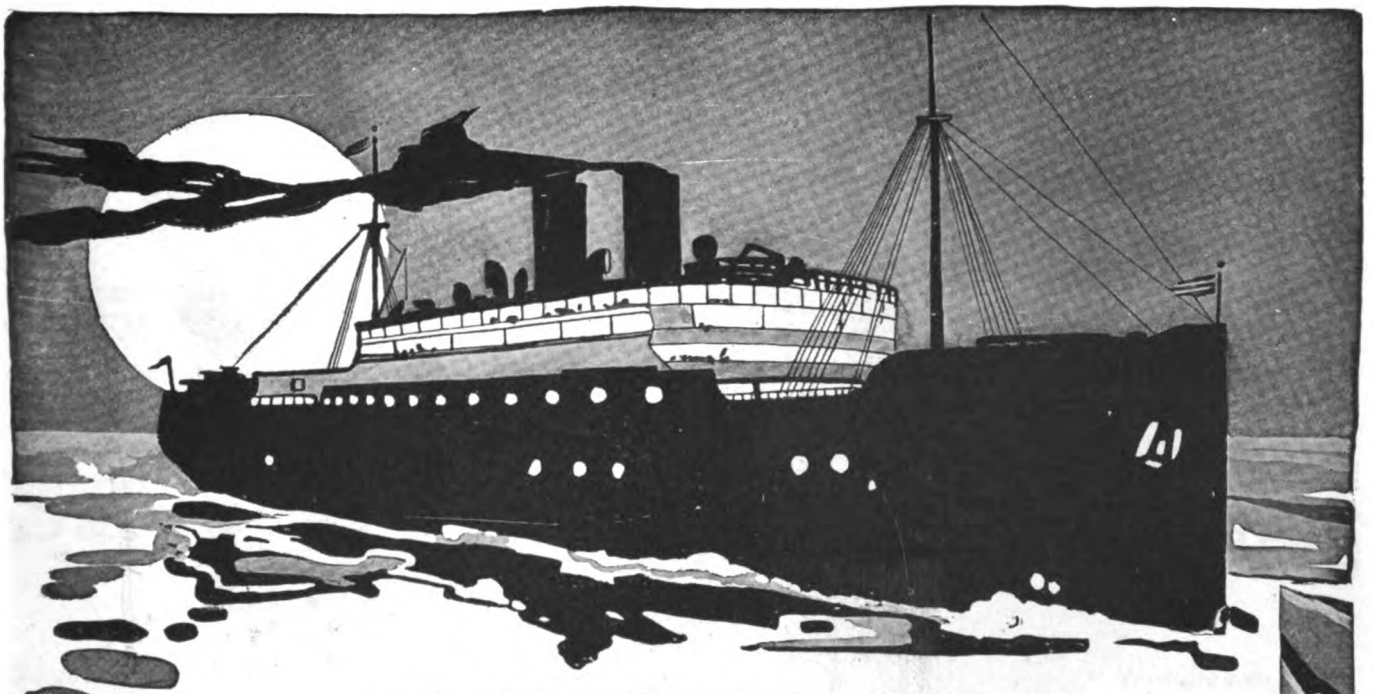

NEW YORK—CLEVELAND—LONDON

Marine Review

THE BUSINESS OF TRANSPORTATION BY WATER

Vol. 52 DECEMBER, 1922 No. 12

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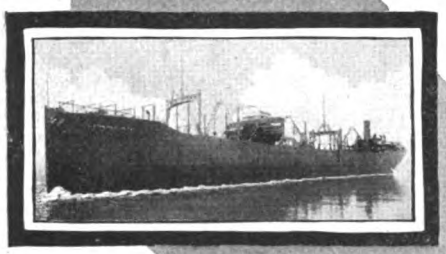
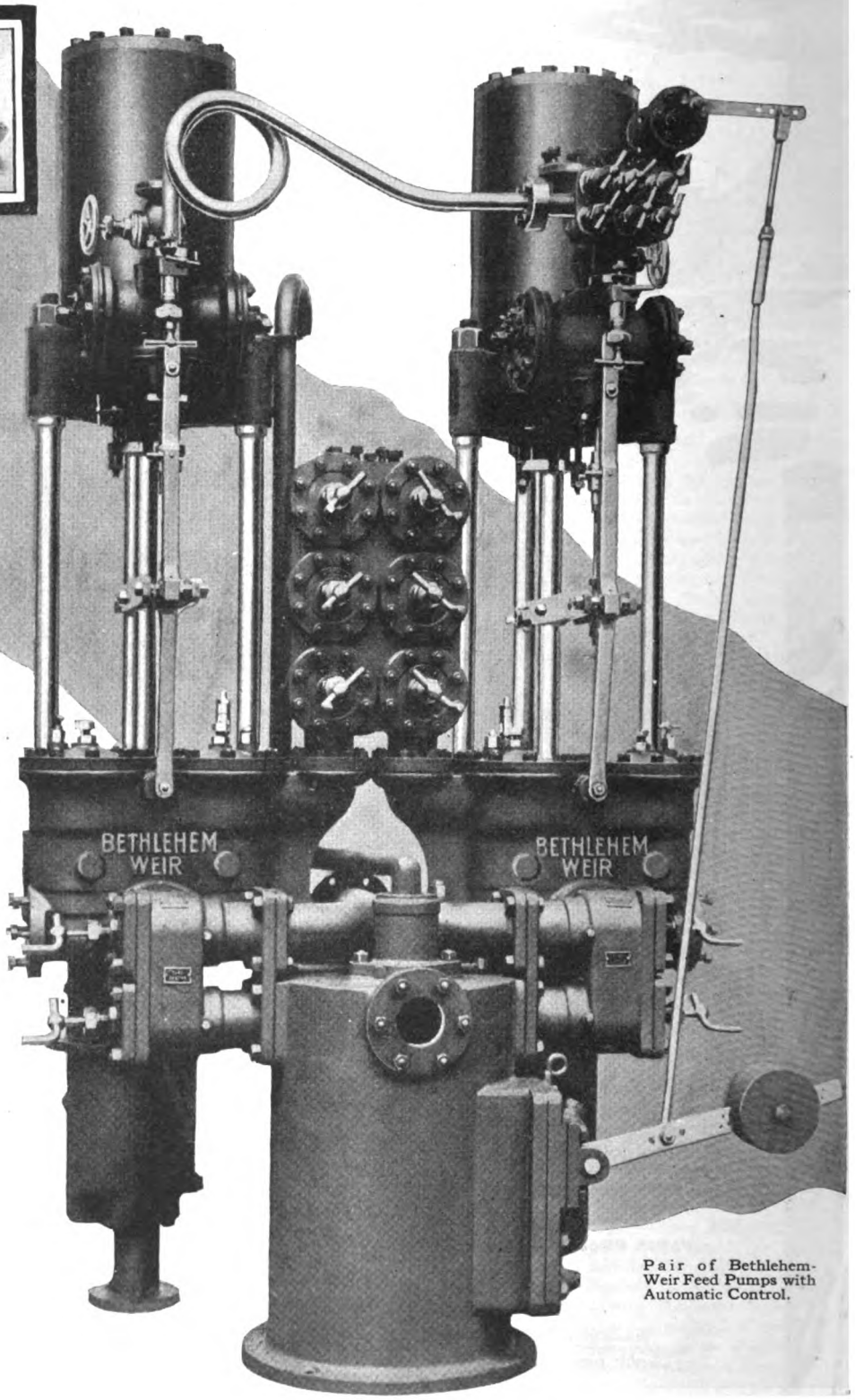
A Feed Pump



S. S. G. Harrison Smith 20,500-ton Combination Ore and Oil Carrier. Equipped with Bethlehem-Weir Feed Pumps.



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NEW YORK CLEVELAND LONDON

VOL. 52 DECEMBER, 1922 No. 12

Salvage Liner by Unusual Method

Sunken Brazilian Vessel Lifted by System of Levers

Winches on Shore Pull Ship Upright in Hamburg Slip

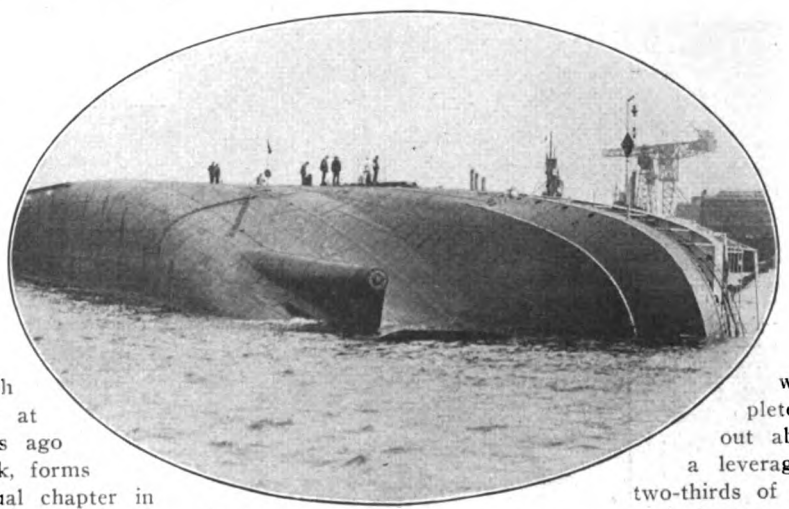


Fig. 1—Surveying the AVARE for raising her

RAISING of the Brazilian government passenger steamer AVARE, which turned over and sank at Hamburg a few months ago after coming off drydock, forms an interesting and unusual chapter in marine salvage work. Carelessness in ballasting the vessel as she was floated in dock and brought out was assigned as the cause of the accident, but exacting care was the order of the day when the steamer was righted and lifted from the harbor bottom.

Where the AVARE sank she was an obstruction to navigation. Her removal as a wreck or her raising intact was decreed as a necessity to safe navigation and on that point hinged the question of what to do and how to do it. It finally was decided to let the contract to the Vulcan Werke Actien-Gesellschaft of Hamburg at a cost of 15,000,000 marks, equivalent to $50,000 at the prevailing rate of exchange. The salvage plan called for dredging a pocket in the harbor bottom at the keel of the capsized craft. Then on the port side of the vessel, which stood about 25 feet above water, 12 built-up structural levers were erected. These are shown in Fig. 3 after being placed, in Fig. 6 rigged and in action, and in Fig. 8 about as their work was being completed. These levers extended out about 35 feet and covered a leverage area of approximately two-thirds of the vessel's length.

A battery of powerful winches was set up on shore, in a building opposite which the AVARE lay. Into the dirt floor of the building huge piles were driven and to these were anchored the windlasses and the blocks and tackle by which the levers were operated. Fig. 4 shows the battery of winches and in Fig. 6 may be seen the lines running from the lever to the winches. In Fig. 6 also is seen a sheer leg crane which lifted the vessel on the side opposite the levers. The combined efforts of the winches, pulling on the levers, and of the sheer leg crane righted the vessel and she settled into the pocket which had been dredged for her. After being righted, the AVARE's port holes

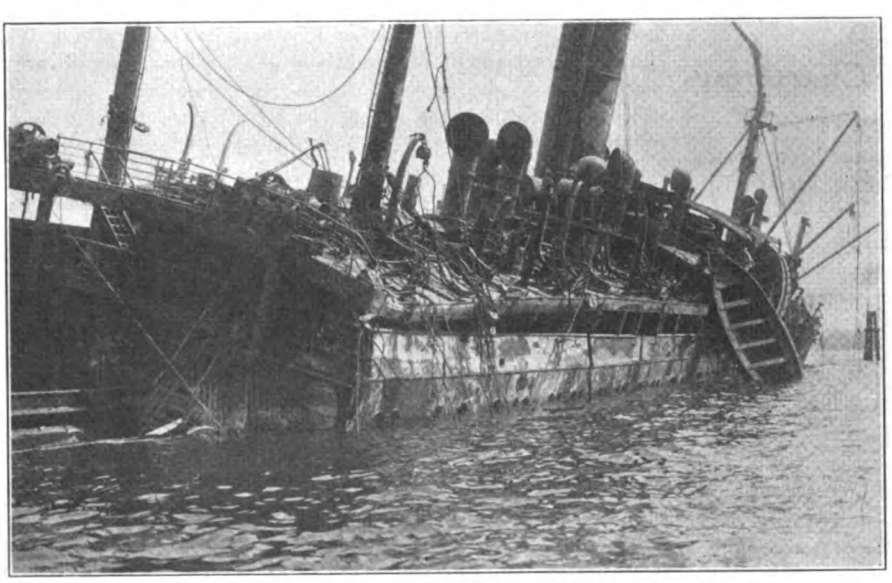
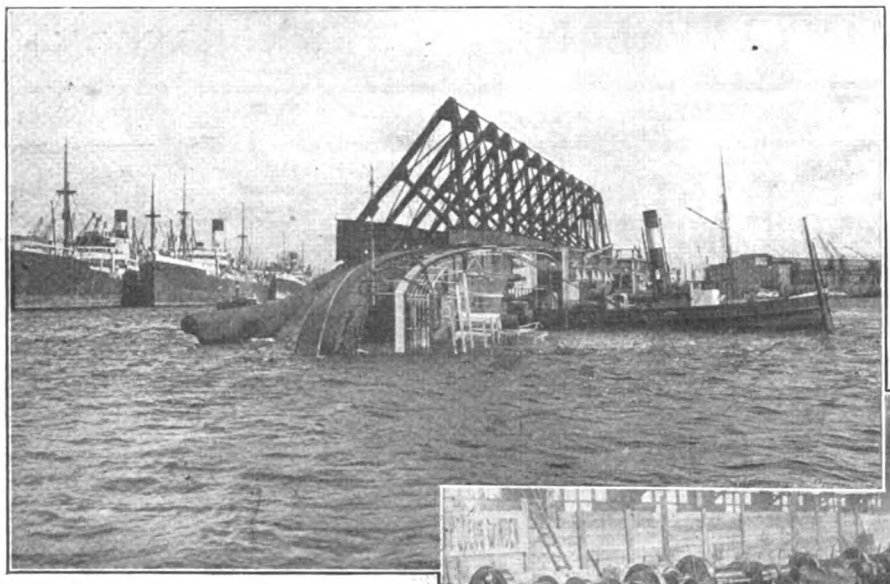


FIG. 2—A CLOSE VIEW OF THE AVARE AFTER RIGHTING

and other openings were closed and she was pumped out and floated. As she looked when righted, but before being floated, may be seen in Figs. 2, 5 and 9. These views show the damage done to her small boats, masts, rigging, etc. How she appeared after capsizing is shown in Figs. 1 and 7.

The salvaging method, while unusual and possible only when a ship capsizes in a harbor or river, proved both effective and economical.



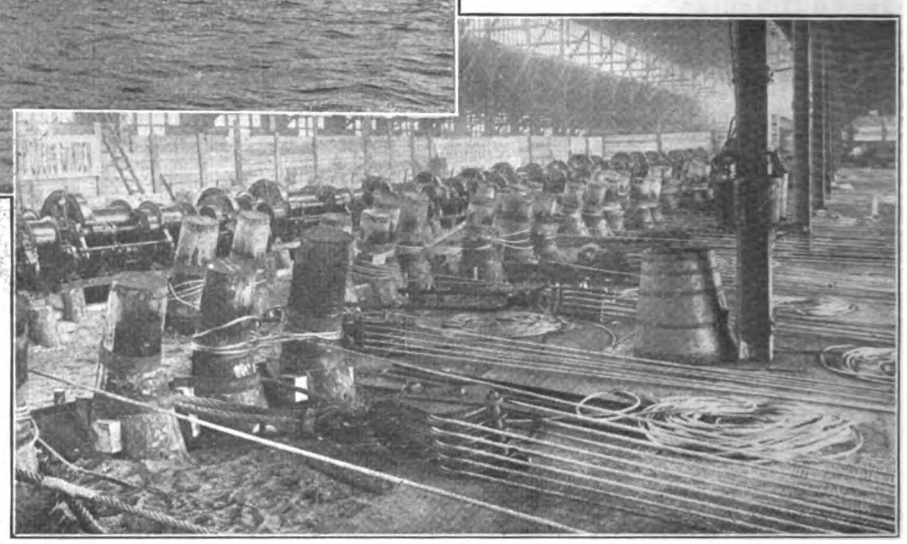


FIG. 3 (ABOVE)—THE 12 LEVERS ON THE SHIPS SIDE ARE SHOWN HERE IN POSITION. FIG. 4 (RIGHT) —THIS SHOWS THE BATTERY OF WINCHES ON SHORE AND THE FALLS ANCHORED TO SPECIALLY DRIVEN PILES

The AVARE is a steel twin screw steamer, formerly the SIERRA SALVADA. She is of 8227 gross tons and 4952 net tons. She is 439 feet 6 inches long, 56 feet wide and 35 feet 6 inches deep. The AVARE was built in 1921 by Bremer Vulkan, Schiffbau & Maschinenfabrik, Vegesack.

North Pacific Chartering Shows Activity

Considerable activity has been shown in chartering in the North Pacific market. In some directions there is a strong demand for vessels although as a rule freights are extremely low, due to the competition between owners to obtain cargo and keep their vessels in service.

The movement of lumber and forest products from Pacific Northwest points to the Atlantic is still at high mark. Rates are extremely firm although there is no conference on this route. Lumber is paying as high as $16 per thousand feet and shippers are clamoring for space. All the lines are practically booked full for the rest of the year. Foreign tonnage has been fixed at above $14 for British Columbia loading. Canned goods, shingles and other commodities are also being handled in large volume.

Recently freights to United Kingdom-Continent have firmed perceptibly due to an increased movement of wheat and flour. Parcel space for wheat and flour has advanced from 28 shillings to 37s 6d and full cargo rates have followed suit. Bookings into the new year have already been made. The war flurry in Europe was responsible for part of this activity although improvement of conditions generally is also given credit. Apples and other perishables are being handled in heavy volume. The established services have just reduced the apple rate from $1 to 90 cents a box to place it on a parity with the transatlantic tariff.

The cargo movement to California is especially strong at this time and space is difficult to obtain as all the coasters are chartered well into the future. Lumber rates to southern California have firmed about 50 cents a thousand feet in the last 30 days. Threatened legislation prohibiting the use of wood shingles in California, however, is causing northern manufacturers some concern.

On the Oriental route conference rates are again in effect although non-conference lines are expected to shade freights should conditions warrant cutting. Japan is not buying forest products in the volume of a year ago and transpacific freights are none too strong. Cancellation of several thousand tons of wheat space has complicated the situation to some extent. Overland cargo is being booked in considerable volume but the shortage of cars is hampering the movement of freight and at times steamship agents are finding difficulty in dispatching their steamers with full cargoes.

Revival of business in Australia is reflected in the increase of lumber shipments to the Antipodes. The regular services are getting $14 to $15 for lumber while sail vessels have been taken at as low as $12. The demand for tonnage to bring coal from Australia to the Pacific coast has slacked off to some extent as importers are committed for sufficient cargo to supply the demand for fuel.

In other directions there are spasmodic calls for sail tonnage but the rates offered are unattractive, and a majority of owners are satisfied to keep their vessels idle until conditions show an upturn. Recently a Japanese steamer was fixed for a full cargo of lumber to South Africa at $19, a new post war low record. Competition for this business has forced the rate down from $22.50 in the last four months.

The movement of seasonal crops, especially fruits, from North Pacific ports to Europe and other markets has shown such a tremendous increase in the last year that shippers have launched a movement for an export rate over connecting rail lines. This it is believed would stimulate the volume and prove of great value to the grower.

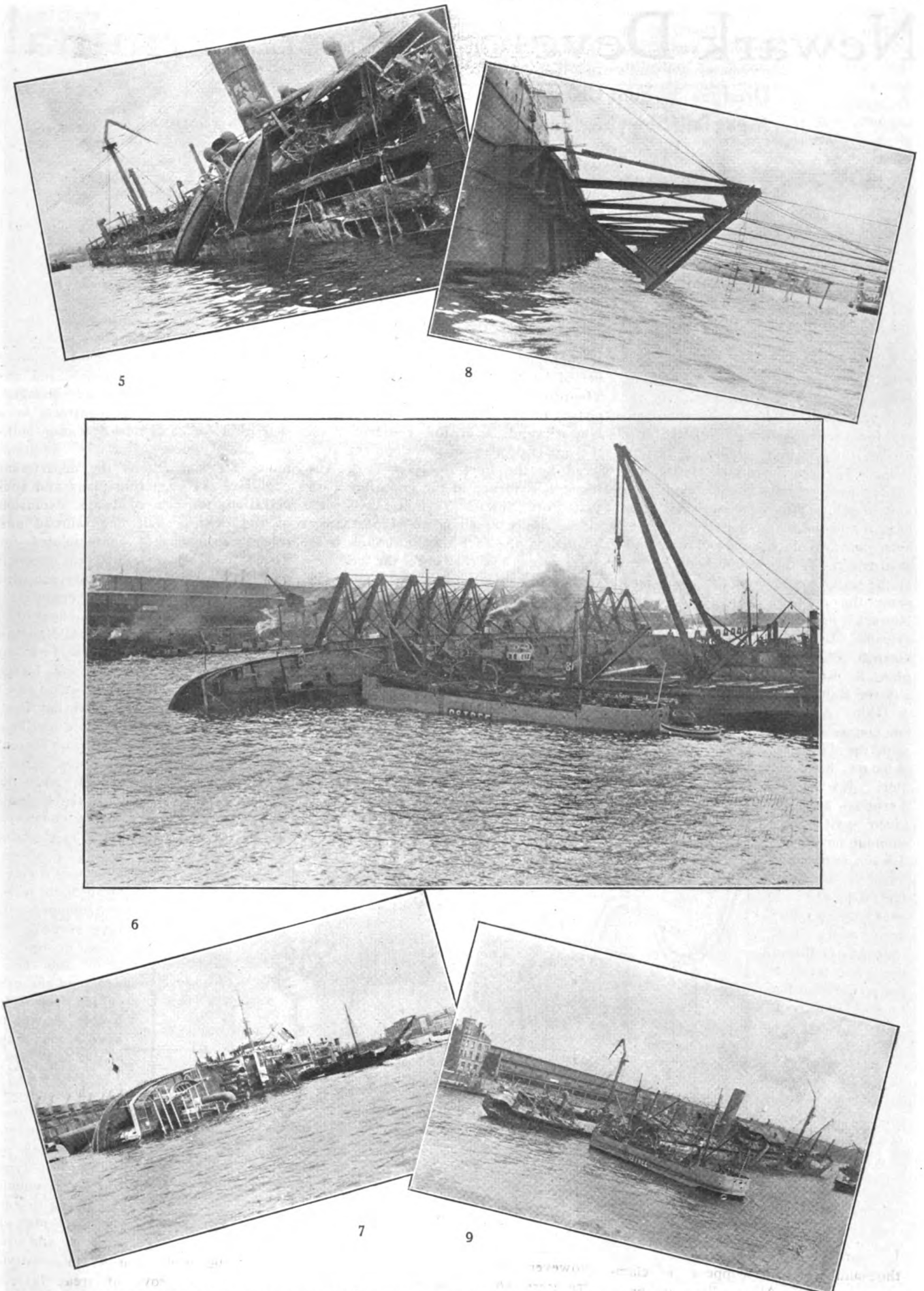


FIG. 5—THE AVARE JUST AFTER BEING RIGHTED. FIG. 6—VIEW SHOWING OPERATIONS IMMEDIATELY BEFORE RIGHTING BEGAN. FIG. 7—THE AVARE JUST AFTER CAPSIZING. FIG. 8—SHOWING POSITION OF LEVERS WHEN THEY COMPLETED THEIR WORK. FIG. 9—THE LINER BEFORE BEING PUMPED OUT AND FLOATED

Newark Develops Port Terminal

Dredges 30-Foot Channel, Constructs Ship Canal and Improves Area for Shipping and Industry—Fights Bridge Obstruction

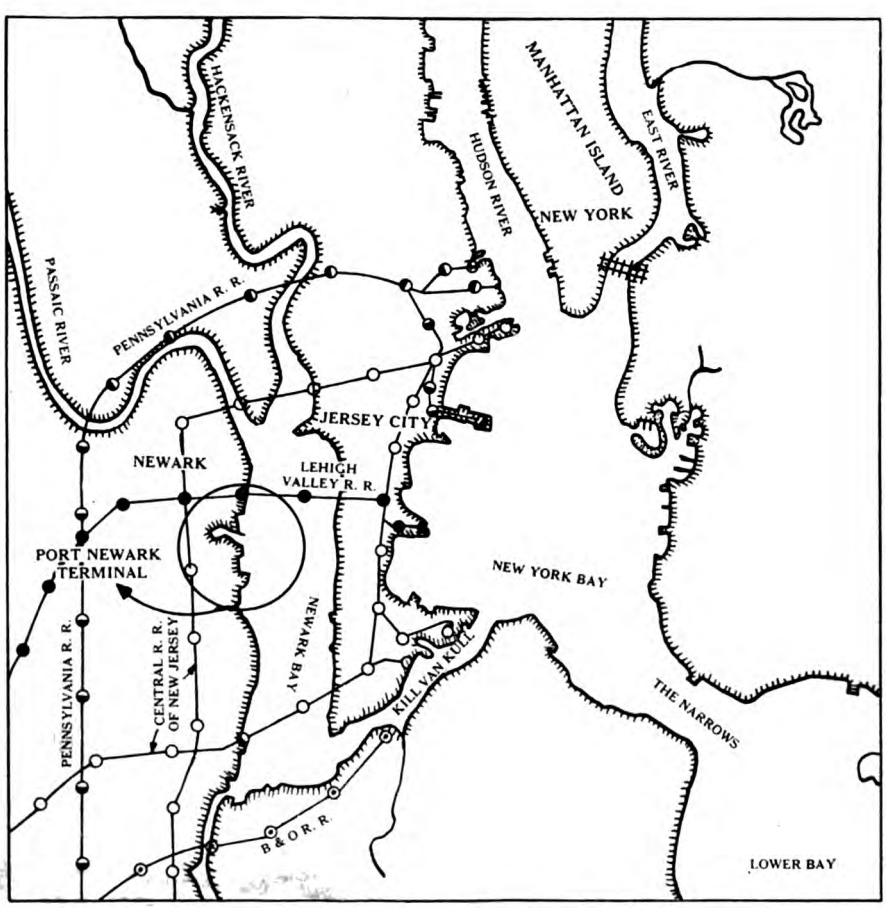
AFTER 15 years of preparatory work the city of Newark, N. J., has about completed the development of some 1400 acres of waterfront land into a deep water shipping terminal and industrial location. The area bears the official title Port Newark Terminal. This development is on the shores of Newark bay, which is an arm of New York harbor, as shown in the accompanying map. The bay is 7000 feet wide and about 4 miles long, and connects with New York via the Kill van Kull. It has a 30-foot channel for the entire length of the bay, dredged by the municipality at its own expense last year. Newark constructed also an inshore ship canal having a 31-foot depth. This waterway is bulkheaded and the major portion is flanked by a marginal dock equipped with railroad track. Within a few hundred feet of the waterfront five of the trunk lines enter the port of New York across Newark's property. They are the Pennsylvania, Lehigh Valley, New Jersey Central, Philadelphia & Reading and the Baltimore & Ohio. A beltline connects these with the docks. About half of Port Newark Terminal area is given over for shipping purposes. The remaining half is to be used for industrial sites. Besides the deep water and railroad facilities the industrial sites are served also by three improved truck highways leading to New York city, to the business section of Newark and to the Lincoln highway, southward. For the entire district the city has installed water, lighting and sewerage systems. There is adequate power supply available. The entire zone is owned by the city, which is endeavoring now to sell sites and lease the waterfront to shipping interests.

Two large war industries, which now occupy a portion of the waterfront area, are being transformed into commercial and shipping terminals. They are the Submarine Boat Corp.'s plant and the United States army quartermaster's supply depot.

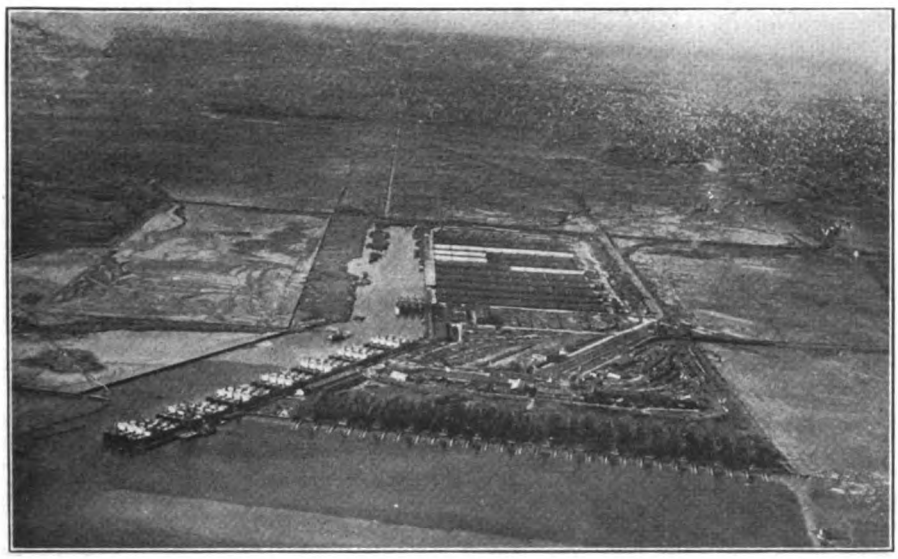
Approximately $6,000,000 has been invested by Newark in this development. The project represents one of the major phases of the expansion of the port of Newark and is in full conformity of the general plan of development fostered by the Port of New York Authority. Evidence of the important part that Port Newark Terminal will play in the future as an ocean seaport, may be had in the fact that, although it is only a few months since the city invited commercial interests to come in and inspect the property, already 45 of these are negotiating for parcels of land along the waterfront. These interests include shipping lines, warehousemen, manufacturers of various kinds and railroads. It is not unlikely that by the first of the new year some important transactions in this connection will be concluded.

Newark is pushing ahead with its construction work at the port. Thomas L. Raymond, city commissioner, who is director of the department of streets and public improvements, is in charge of the waterfront development and unless his present plans are changed, he will probably award contracts in a short time for some new dredging, bulkhead and dock work. In addition, under his instructions the department engineers are preparing plans and specifications for new roadways, extension of the existing belt line railroad and other improvements contemplated for early spring. The actual construction work at Port Newark is being executed by James W. Costello, chief engineer.

Commissioner Raymond is engaged in a controversy with the Central Railroad of New Jersey over its bridge which crosses Newark bay from Bayonne to Elizabeth. The present structure is antiquated and the Central is desirous of constructing a new bridge having a 35-foot clearance above mean high water and equipped with two vertical lift draws, one of them 200 feet wide and the other 125 feet wide, both draws to have a maximum height of 135 feet. The proposed bridge would permit the easy passage of all ocean-going vessels of the largest type. But Mr. Raymond is fighting to wipe out the bridge altogether and prevent the construction of any new bridge there. Sec-



MAP SHOWING RELATION OF PORT NEWARK TO NEW YORK HARBOR



VIEW FROM AIRPLANE SHOWING PORT AREA AND NEWARK IN BACKGROUND

retary of War Weeks has been studying both sides of the controversy. It is the intention of Commissioner Raymond to carry his fight to the furthest extremes, and consequently, in the event of an adverse decision by the secretary of war, he will go at once into the United States courts. To that end counsel has been engaged and Newark's legal case is in the course of preparation.

JAMES W. COSTELLO
Engineer in Charge of Port Construction

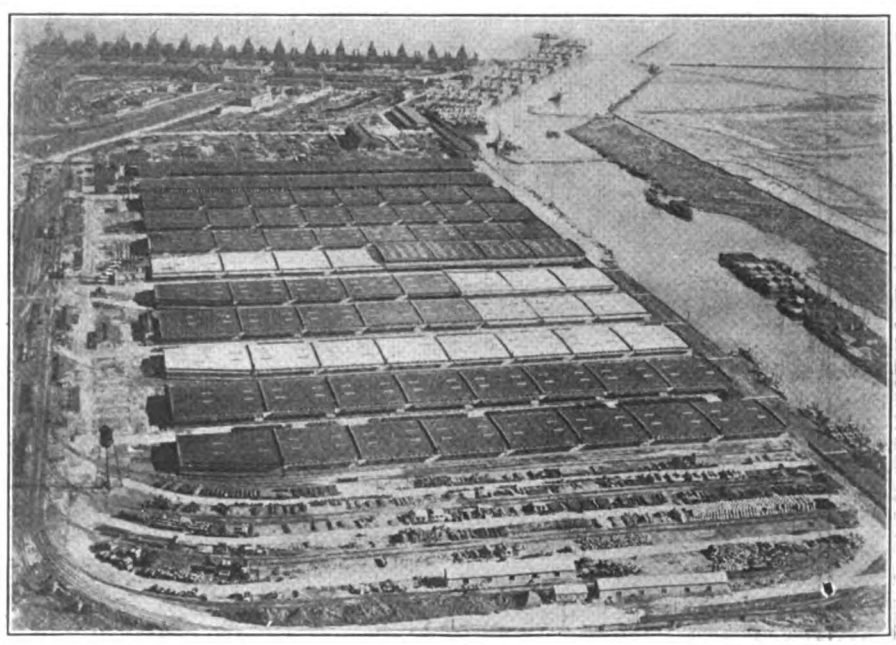
While the Newark city government, as represented by Commissioner Raymond, is of the mind that the construction of such a modern bridge as the Central proposes to build would not blot out Newark's port development entirely, the municipality feels there should be no barrier of any kind on this navigable harbor. Newark feels that any bridge would be, in some degree at least, a menace to navigation, a hindrance to the full development of Newark's great waterfront possibilities and an adverse factor in the life of trade and shipping in the port of New York.

Newark offers relief to the existing crowded conditions in the mother port, it is argued. By reason of the direct rail-to-water facilities offered, the lighterage question will be greatly simplified for shippers from all over the United States. The railroad can cross the bay further up where it now has other bridges which are not great obstructions to navigation. If the railroad must cross the waterway from Bayonne to Elizabeth, a tunnel should be constructed in place of the bridge, the city contends. Newark's position in this fight is given the hearty support of the governments of Jersey City and Bayonne, which also front on Newark bay.

The Atlantic Deeper Waterways association, at its recent convention in Portland, Me., unanimously adopted resolutions protesting against the construction of hindrances of any type whatever that would hamper the free passage of shipping on all navigable streams or harbors. At the time the organization went on record it had the Newark bay bridge controversy in mind, it is stated.

THOMAS L. RAYMOND
Who Directs Newark's Terminal Growth

Port Newark Terminal is within a 5-mile radius of all the great transcontinental railroads which terminate on the Jersey side of the Hudson. These steel highways from the Middle West and Great Lakes districts carry more than 40 per cent of the total freight exports from the United States. New



AIRPLANE VIEW OF WAREHOUSE, RAIL AND DOCK FACILITIES ON SHIP CANAL

York harbor, with all its splendid features, it is argued, cannot assimilate or accommodate the increasing traffic that pours into its wharves, warehouses and piers. Much of this traffic can be readily diverted to Port Newark Terminal. This logically solves the congestion problem and eliminates the nuisance of lighterage, which is a constant burden and handicap to exporters.

As part of New York harbor, it must be borne in mind Newark bay is really the reserve of the great eastern gateway, and though not completely developed, it has proved its right to serious consideration at the present time, its supporters contend. Vessels drawing 30 feet of water can be accommodated; there are adequate dock and warehouse facilities, some 7000 lineal feet of marginal dock, equipped with standard gage trackage, and about 2,500,000 square feet of warehouse floor space fronting directly on the dock.

The federal government has recognized the worth of Newark bay as an adjunct of the port of New York. Early in 1922 the chief of army engineers recommended a federal expenditure of $2,100,000 toward doubling the width of the present 200-foot channel. Later the 30-foot depth is to be extended to a width of 700 feet, and the ultimate project calls for a 1200-foot channel. Congress has authorized the appropriation. Army engineers and Newark city officials are proceeding on that basis, preparatory to the actual dredging.

Ocean Freight Rates

Per 100 Pounds Unless Otherwise Stated

Quotations Corrected to Nov. 10, 1922, on Future Loadings

New York to	Grain	Provisions	Cotton (H. D.)	Flour	General cargo cu. ft.	General cargo 100 lbs.	††Finished steel
Liverpool	3 Sh.	$0.35	$0.27½	$0.15	$0.30	$0.60	$7.00T
London	3 Sh.	0.35	0.27½	0.15	0.30	0.60	7.00T
Christiania	$0.20	0.40	0.47½	0.25	0.37½	0 80	7.00T
Copenhagen	0.20	0.40	0.47½	0.25	0.37½	0.80	7.00T
Hamburg	0.13	0.20	0.25	0.17	0.37½	0.75	8.00T
Bremen	0.13	0.20	0.25	0.17	0.37½	0.75	7.50T
Rotterdam	0.13	0.25	0.25	0.17	0.35	0.70	4.50T
Antwerp	0.13	0.27½	0.25 to 0.30	0.17	0.35	0.70	6.50T
Havre	0.15	0.40	0.22½	0.19	0.40	0.75	9.00T
Bordeaux	0.15	0.40	0.37½	0.19	0.40	0.75	9.00T
Barcelona	0.18	0.55	0.50	7.00T	—20.00T—		9.00T
Lisbon	0.20	0.75	0.50	7.00T	—20.00T—		7.00T
Marseilles	0.18	0.75	0.65	5.60T	—20.00T—		7.00T
Genoa	0.17	0.50	0.32½	0.30	0.40	0.75	8.00T
Naples	0.17	0.50	0.37½	0.30	0.40	0.75	9.00T
Constantinople	22 to .25	15.00T	0.75	0.25	—20.00T—		8.00T
Alexandria	22 to .25	15.00T	0.75	0.25	—20.00T—		8.00T
Algiers	0.25	0.65	0.50	0.30	—20.00T—		12.00T
Dakar	.....	14.50T	.....	14.50T	—20.00T—		10.00T
Capetown	10.50T	18.00T	.....	15.00T	—18.00T—		11.25T
Buenos Aires	.....	.....	.....	.....	—20.00T—†		6.00T †
Rio de Janeiro	.....	.....	.....	.....	—21.00T—†		6.00T †
Pernambuco	.....	.....	.....	.....	—20.00T—†		8.00T†
Havana	0.17½*	0.37½*	.....	0.17½*	0.47*	0.94*	0.20*
Vera Cruz	.....	0.45	.....	0.20	0.45	0.90	0.35
Valparaiso	.....	1.07	.....	0.70	0.45	0.80	12.00T
San Francisco	.....	0.40	.....	0.56	....	....	0.30
Sydney	.....	.....	.....	.....	20.00 to 25.00		11.50
Calcutta	.....	16.00T	.....	.....	—16.00T—		10.00T

T—ton. †Landed. ††Heavy products limited in length. *Extra charge for wharfage.

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San Francisco	$6.50 to 7.00
South California	7.50 to 8.00
Hawaiian Islands	10.00 to 12.00
New Zealand	12.00 to 14.00
Sydney	12.00 to 15.00
Melbourne-Adelaide	12.00 to 15.00
Oriental Ports	9.00 to 11.00
Peru-Chile	15.00 to 18.00
South Africa	19.00 to 20.00
Cuba	17.00 to 18.00
United Kingdom	90s
United Kingdom (ties)	70s
Baltimore-Boston range	14.00 to 16.00
Baltimore-Boston range (ties)	13.00 to 14.00
Buenos Aires	17.00
Flour and Wheat	
Oriental Ports	$ 5.00
U. K. and Continent	36/3 to 38/9 T
Scandinavia	45s to 47/6 T
Mediterranean	45s to 47/6 T
West Coast Italy	2/6 higher
Steel	
Oriental ports	$5.00T
Cotton	
Oriental ports	35c to 50c per cwt.
Apples	
United Kingdom	$1.00 per box
Copper	
Oriental ports	$5.00
Box Shooks	
Oriental ports	$10 measurement ton
Metal Junk	
Oriental ports	$10
Scrap Copper	
Oriental ports	$5
Salt Herring	
Oriental ports	$8 measurement ton

Principal Rates To and From United Kingdom

	s	d
Grain, River Plate to United Kingdom	25	0
Coal, South Wales to Near East	13	6
Coal, Newcastle to France	6	6
Coal, South Wales to Buenos Aires	14	6
Iron ore, Bilbao to Middlesbrough	7	3
General British market, six months time charters, per ton per month	4	6

Bunker Prices

At New York

	Coal alongside per ton	Fuel oil alongside per barrel	Diesel oil alongside per gallon
Oct. 4	$5.85 @ 6.15	$1.45	5.25 cents
Jan. 9, 1922	5.50 @ 5.90	1.25	5.50 cents
April 6	5.30 @ 5.90	1.16½	4.75 cents
July 1	8.10	1.26½	4.75 cents
Oct. 13	8.55	1.45	5.50 cents
Nov. 10	8.05	1.615	5.125 cents

At Philadelphia

	Coal alongside per ton	Fuel oil alongside per barrel	Diesel oil alongside per gallon
Oct. 6	$5.10 @ 6.25	$1.80	4.25 cents
Jan. 9, 1922	5.10 @ 5.35	1.50	5.00 cents
April 10	5.90 @ 6.25	1.05	4.25 cents
July 1	8.00	1.15	4.25 cents
Oct. 13	8.30	1.47	5.00 cents
Nov. 15	*7.90	1.61½	5.00 cents

*t. i. b.

Other Ports

Boston coal, per ton, $10.00
Boston, oil, f. a. s., per barrel $1.50 to 1.55
Hampton Roads, coal, per ton 9.00
Seattle, coal, per ton. 7.50 to 8.50
Cardiff, coal, per ton 10s
London, coal, per ton. 22s
Antwerp, coal, per ton 22s

Marine Week Proves Big Success

Naval Architects Discuss Standardization. Ship Operating Efficiency, Types of Propelling Machinery—Keen Interest in Exhibits

VIGOROUS emphasis was placed on the necessity for intelligent handling of the shipping problem in this country by speakers and members participating in the thirtieth general meeting of the Society of Naval Architects and Marine Engineers at New York, Nov. 8-9. This keynote was sounded not only in relation to legislative phases of the problem, of which the pending subsidy legislation is the most important, but in relation to improved efficiency of shipyard and vessel operation. Standardization in the shipbuilding industry was urged and widely approved as one method of reducing American costs.

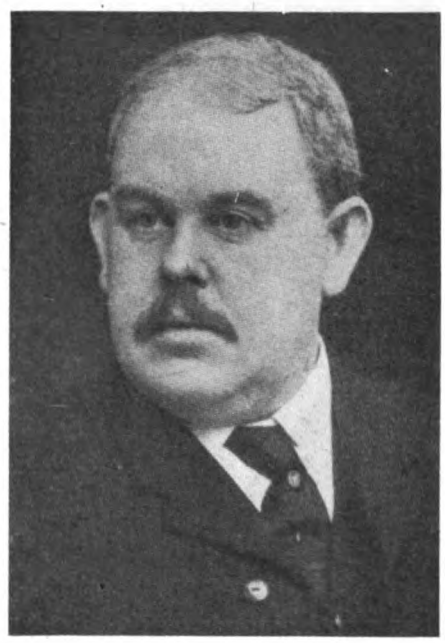
Practically the unanimous thought of the members was voiced by Capt. W. M. McFarland, president of the society, in his address of welcome, when he said that, "The question of supreme interest for all of us just now is the shipping bill." He also expressed a feeling of encouragement at the effective results of education on the shipping question, particularly in the interior. The scientific phase of the effort to aid the merchant marine by increased economy was touched on by E. H. Rigg in a paper on standardization in the shipbuilding industry, and in a more direct manner by Capt. D. A. J. Sullivan in a paper on efficiency in the operation of steamships

Meetings of the society were well attended. They were held at the Grand Central palace so that the members were able to keep in close touch with the marine exposition.

The following new officers were elected:

Joseph H. Linnard, honorary vice president; vice presidents for the term expiring Oct. 31, 1925, Albert P. Niblack, Richard M. Watt, Charles P. Wetherbee, Harvey D. Goulder; members of council for the term expiring Oct. 31, 1925, Charles A. McAllister, Theodore E. Ferris, Hugo P. Frear, William L. R. Emmet, J. Howland Gardner, William J Davidson; associate members of council for the term expiring Oct 31, 1925, Alfred Gilbert Smith, vice, Robert A. C. Smith resigned, George D. Ali; executive committee, Stevenson Taylor, Washington L. Capps, Andrew Fletcher, Frank L. DuBosque, Joseph W. Powell, Homer L. Ferguson, Alfred Gilbert Smith; committee on papers, Frank L. DuBosque, J. Howland Gardner, Herbert L. Aldrich; secretary-treasurer, Daniel H. Cox; assistant secretary-treasurer, Thomas J. Kain.

In his address of welcome, Captain McFarland discussed the successful operation of that class of ship begun during the war as transports and completed as liners, and covered also



CAPT. W. M. McFARLAND,
President of the Society of Naval Architects and Marine Engineers

the considerable number, about 150, of cargo ships from the fabricating yards, which have made excellent records and reflected credit on their builders. The economy of the diesel engine is of vital importance now in view of the necessity to save at every point. For large powers and high speeds the geared turbine seems established. The electric drive has worked with satisfaction in the navy. The diesel-electric drive is being tried out in some vessels of moderate size.

"Automatic Steering" by E. A. Sperry, was the first paper presented. The author pointed to the economy resulting from steering a true course. The gyroscopic compass in this case becomes the hand that throws in the contact when the "iron quartermaster" is needed to turn helm in either direction to keep the ship on her course. He described the actual operation of an installation on board ship.

"Details of Naval Design from Jutland" by Commander H. S. Howard, is particularly intended to study the more personal experiences, bringing out actual failures of the important auxiliaries. The author found that the fire menace was not as serious as had been anticipated. The steering gear failed in several important instances, and it is recommended that this auxiliary on fighting ships be subjected to the severest specifications and tests. Torpedo nets are condemned.

"The Application of Dyson's Method to Propellers of Ocean-Going Merchant Vessels" by E. A. Stevens Jr., is an analysis of the actual or estimated hull and propeller data from trials and actual operations of 14 ocean going merchant vessels of varying types compared with results of independent calculations by Dyson's methods. A fairly close agreement is obtained. This was to be expected as Dyson's formulas are largely empirical, that is built up on the study of a vast amount of accumulated trial data.

"Stresses on Vessels of the Great Lakes Due to Waves of Varying Lengths and Heights" by Prof. H. C. Sadler and Prof. A. Lindblad is reprinted in full in this issue.

"A Study of the Wake of Certain Models by Means of a Current Meter" by Prof. E. M. Bragg, indicates that for any complete system for determining wake values, the following conditions must be taken into account: 1—the diameter of screw relative to draft of ship; 2—the draft of ship relative to her breadth; 3—the fore and aft position of the screw; 4—the vertical position of the screw relative to the keel; 5—the transverse position of the screw; 6—the vertical prismatic coefficient of the ship. This paper is a real contribution toward the solution of an important problem in the determination of power and speed of ships.

"Efficiency in the Operation of Steamships" by Capt. D. A. J. Sullivan, points first to the high quality of American seamen and ships of another age, and with logic claims that what the nation has done on the sea can again be done if success depends on men and ships. An interesting table of the percentage of the total cost of operation represented by different items, shows fuel oil to be by far the

greatest. In this item, Americans are not at a disadvantage. The other important items are handling of cargo, wages and insurance. In these items, Americans are at a disadvantage as compared with foreign operators. However, a better trained personnel with more responsibility reposed in them, and a keen application of economy in every item of expense would make it possible to compete provided some means can be found to take care of the excessive first cost.

"Some Experiments on Propeller Position and Propulsive Efficiency" by Rear Admiral D. W. Taylor, C. C. U. S. N., discussed experiments on the slow speed cargo ship, the most common type, the wheel horse of the ocean trade. It has received the least care and attention in scientific study. Particular interest, therefore, attaches to these experiments conducted by such an authority. The conclusions are clear that the highest possible practical location of the propeller gives greatest hull efficiency and makes possible greater efficiency of propulsion. Variation of slip had little effect. The fore and aft position of propeller did not have any material bearing on efficiency. The discussion brought out that when the wake can be closely estimated, Taylor's *rho delta* diagrams give accurate results in propeller design and are by far the simplest in use. These diagrams were developed through comprehensive mathematical analysis of extensive model propeller experiments and are fundamental.

"A Sixteen Hundred and Fifty Horsepower Gasoline Fire Boat" by A. D. Stevens, described a wooden hull 110 feet x 14 feet x 8 feet with two 220 horsepower gasoline motors, air starting and reversing; four 8-inch, 3-stage centrifugal pumps each direct connected to a 300 horsepower, 8-cylinder gasoline motor, making a total, including propelling machinery, of 1640 horsepower. Electric blowers are provided for ventilation. The capacity of this fire boat is 7000 gallons per minute. The speed of the boat is 15 miles per hour wih a displacement of 110 tons and draft of 7 feet.

"The Longitudinal Strength of Rigid Airships" by Prof. William Hovgaard, resulted from a study carried out by the author while retained by the navy department in connection with the design of the rigid airship ZR-1. It is shown that the mode of calculations referred to as "The method of bending moments" is essentially sound and that with certain modifications it is reliable as a means of comparison between strength of different airships, whereas the mode of calculations known as "The method of transverse shears", can not give a complete solution as it does not take into account the elastic strains and stresses due to bending of the ship as a whole. The author gives an important addition to the paper in the form of a discussion of the two methods.

"Machinery and Trials of the Passenger Ships—American Legion Class" by Robert Warriner, is an interesting exposition of trial data as compared with results from a fairly good standardization trial of a completed ship. The shaft horsepower as estimated from a self-propelled model and from

DANIEL H. COX,
Secretary and treasurer of the Society of Naval Architects and Marine Engineers

a standardization trial do not agree closely. The author, however, states that the final results fall far short of what one would wish because one of the ships was not standardized on a course of sufficient depth to obviate any guessing at the true speed in deep water.

To make a comparison of this nature of full scientific value, the same methods as applied to navy ships should be adopted. All experiments with the model representing finally adopted lines on which the ship is built, are carefully worked up. The standardization trials are carried through with utmost care under the conditions of design. When these results are compared with the model results, remarkable agreement prevails.

"Standardization as Affecting the Shipbuilding Industry in the United States," by E. H. Rigg touches on the difficulty of complete standardization in an industry as diversified as shipbuilding. Practically every trade known to man is applied. However, standardization can and has been applied to many parts and to main and auxiliary machinery. He recommends particularly standardization in electrical requirements for land and sea service, and also the codification of governmental requirements for merchant vessels under one set of regulations.

"The Selection of the Best Kind of Propelling Machinery" by J. L. Ackerson, shows that the main factors in determining propelling machinery are, reliability, economy in operation, initial cost and weight. Of these, reliability is of chief importance and it depends on two factors, the choice of builder and a competent personnel for operation after delivery to owner. Rather complete tables give comparisons of the efficiencies of steam reciprocating and turbine and finally diesel units. Discussion of the paper brought out the extreme low cost of motorship operation. It was demonstrated that a round trip from United States to Scandinavia could be made carrying enough fuel oil in the double bottoms for the ship's use and to sell enough abroad to pay, for the cost of fuel for the entire trip.

Elects New Officers

Exceeding in attendance and real live interest shown, the greatest hopes of its sponsors and exhibitors, the second annual marine exposition was held in the Grand Central Palace, New York, Nov. 4 to 11 under the auspices of the American Marine Association. The organizations taking part in the exposition are those which have survived the remaking of the marine industry since its after-war deflation. They are working to develop the marine industry and this gathering demonstrated the success which they are winning. This spirit of confidence was the strongest undercurrent of thought among the men who have to do with ships, their building equipment or operation, at the 1922 marine exposition.

The exhibitors were satisfied that it was worth their while and most of them have engaged equal or larger space for next year. Many who did not exhibit applied for space for the next exposition. The co-operative method of control worked out with unanimous satisfaction. The marine men feel that they are getting what they pay for and their convenience and needs are better taken care of.

For the definite purpose of considering the important question of standardization in shipbuilding and operation and to eliminate waste, a meet-

ing of members of the leading marine associations was held on Nov. 10, having been called by Herbert Hoover, secretary of commerce. Col. E. A. Simmons was chairman. R. M. Hudson, representing Secretary Hoover, ably presented the broad outline of the purposes and objects of standardization. A discussion followed indicating deep interest in the possibility of economy. It was questioned how far standardization could go in an industry made up of so many diversified trades and interests. A committee of five or more is to be appointed by the chairman for determining a method of procedure.

At the business session of the American Marine association, Col. E. A. Simmons was re-elected president.

Docking President Madison Sets Seattle Record

The transpacific liner PRESIDENT MADISON recently was docked at the plant of Todd Dry Docks, Inc., to have propeller blades straightened. The PRESIDENT MADISON measures 14,187 gross tons and is the largest vessel ever lifted in Seattle. The previous record was held by the H. F. ALEXANDER, 8255 tons, docked and repaired at the same yards a few months ago. Recently the yard added a fifth section to its drydock so that it can now easily accommodate the 535 foot vessels operating to the Orient.

Contract for repairing the steel freighter KETCHIKAN, of the Alaska Steamship Co.'s fleet, has been awarded the new plant of the King & Winge Shipbuilding Co., Seattle. This firm recently took over the site of the former Nilson & Kelez shipyard.

The former Standifer steel shipyards at Vancouver, Wash., have been taken over by United States Molybdenum Metals, Ltd., which announces the immediate construction of a metal refining and smelting plant.

At a cost of $80,000 a terminal railway, linking two government docks, will be built at Vancouver, B. C.

Todd Dry Docks, Inc., is completing one of the largest marine jobs awarded in recent months in preparing the Canadian Pacific liner EMPRESS OF AUSTRALIA for sea. This vessel, formerly a German transatlantic liner, was 700 miles at sea bound for the Orient when engine trouble developed and it was necessary to return to Victoria. The local yard obtained the repair contract but the vessel was so large that she could not be docked in any of the Todd drydocks in Seattle. Consequently she was sent to the large graving dock at the Puget Sound navy yard. Extensive engine overhauling and repairs were necessary, the work occupying a month. According to reports examination showed the trouble was due to the fact the turbine shaft, a piece of steel 30 feet long by 22 inches in diameter, was out of line.

41 Vessels Are Ordered from American Shipyards During Past Month

CONTRACTS for 41 vessels have been placed within the past month. By far the larger number of these are barges, scows, etc., but steamers of size are included among them, some of which are two 250-foot freighters for the United States Steel Products Co., one 3000-ton freighter being built by the Collingwood Shipbuilding Co. for its own account, and one 250-foot combination freight and passenger ship for the Alaska Steamship Co. Twenty of the vessels placed are barges for the American Steel & Wire Co. for river service. The various contracts placed in the month as well as new orders pending are:

SHIP CONTRACTS PLACED

Collingwood Shipbuilding Co., Collingwood, Ont., one 3000-ton boat, building on own account.

United States engineer, Florence, Ala., two steel barges to Charles Ward Engineering Co., Charleston, W. Va.

United States Steel Products Co., two 250-foot vessels of ore carrier type, diesel engined, to be operated between Great Lakes ports and coast ports, to Federal Shipbuilding Co., Kearny, N. J.

United States engineer, New Orleans, two steel oil barges, to Midland Barge Co., Midland, Pa.

American Steel & Wire Co., 20 steel barges, each 175 x 26 x 11 feet, for river service, to American Bridge Co.

Consolidated Co., Inc., Plaqueminc, La., two steel oil barges, one 100 x 22 x 5 feet and the other 100 x 16 x 5 feet, to Alex Dussel Iron Works, New Orleans.

United States army, eight steel fuel barges, each 120 x 24 x 7.4 feet, to Willamette Iron & Steel Works, Portland, Oreg.

Alaska Steamship Co., one combination freight and passenger steamer, 364 feet long, 49 feet beam and 25 feet 6 inches deep, to Todd Dry Dock & Construction Corp., Tacoma, Wash.

Red D Line, one passenger and cargo vessel, 325 feet long, twin screw, 3100 deadweight tons, to New York Shipbuilding Corp., has bought second boat completed.

New York Central railroad, two canal barges, to Sun Shipbuilding Co.

SHIP CONTRACTS PENDING

British Columbia interests, ferry to carry 50 automobiles and 250 passengers, to be ready for service July 1, 1923, between Vancouver and Vancouver island, bids asked.

Victoria-Anacortes Ferry Co., ferry, 146 x 34 x 9 feet, to carry 30 automobiles, to have 500-horsepower diesel plant, for service between Anacortes, Wash., and Sidney, B. C., bids asked.

United States engineer, Buffalo, three dump scows, each 110 x 32 feet, of 400 cubic yards capacity, bids in.

Owner unidentified, steel protection asked for six power barges in Cleveland market.

United States engineer, Montgomery, Ala., one steel barge, 80 x 26 x 5 feet, bids being taken.

Tide Water Oil Co., New York, three 300,000-gallon steel barges, each 162 x 36 x 10 feet, bids being taken.

Hudson River Day line, one paddle wheel steamer, 338 x 76 x 13 feet 8 inches, bids in.

Burlington Island Amusement Co., one new 240-foot excursion steamer for Delaware river service, and rebuilding another, Chapman & Fisher Co., 524 Walnut street, Philadelphia, architect and engineer; bids in.

Chapman & Fisher Co., 524 Walnut street, Philadelphia, architect and engineer, taking bids on two ferryboats in connection with Delaware river terminal project; also taking bids on construction and rebuilding of several tank barges.

Philadelphia & Reading railroad, two ferryboats and two carfloats, bids asked.

DeFrain Sand Co., Philadelphia, two barges, bids asked.

United States engineers, Pittsburgh, three barges, bids asked.

New York Central railroad, rejects bids on five steel barges and new bids asked.

Frank J. Shipman of the Texas Co. succeeds William Wampler of the Ellcon Co. as vice president. Ernest Lee Jahncke, Jahncke Shipbuilding Co., New Orleans, L. H. Krondorff, Federal Shipbuilding Co., Kearny, N. J., William Wampler, Ellcon Co., New York. James Plummer, Newport News Shipbuilding & Dry Dock Co., Newport News, Va., and J. J. Tynan, Bethlehem Shipbuilding Corp., San Francisco, Cal., were elected to the executive committee to succeed respectively Paul Jahncke, Frank Hatch, H. C. Davis, William Stayton and J. L. Luckenbach. H. F. Alexander, Pacific Steamship Co., Seattle; F. C. Bradbury, Crane Co., Chicago; W. S. Doxsey, MARINE REVIEW, Cleveland, and Charles F. Scott, general Electric Co., Boston, were re-elected members of the executive committee.

to the Oregon Boiler Works, Seattle, for $40,000. This vessel struck a submerged iceberg in Alaskan waters and was further damaged when she was run ashore. Fifty plates will have to be removed of which 35 will be renewed. The contractors will use the Heffernan dock for making repairs.

Yarrows, Ltd., of Victoria, B. C., is repairing extensive damage to the Canadian Pacific steamer PRINCESS BEATRICE which grounded near Prince Rupert, B. C.

Unusual interest attaches to the stern-wheel steamer MARIE being built at the Columbia River Drydock, Engineer & Construction Co., Portland. This vessel is designed with a steel frame with wood planking outside. Steel trusses are provided doing away with hogposts and chains common to wooden hulls of this type.

Three marine ways are being built at

Many of the vessels going to southwestern Alaska are taking oil drilling machinery and equipment to be used in oil drilling operations for the Standard Oil Co. in the Coal Bay district and for two other big companies which are doing exploration.

What the British Are Doing

Short Surveys of Important Activities in Maritime Centers of Island Empire

LORD Inchcape, presiding at the annual meeting of the P. & O. Steam Navigation Co., mentioned that during the past year the ships of the combined companies had traversed over 16,000,000 miles and carried 2,500,000 passengers and crew. The increasing popularity of world touring also is shown by the special construction and equipment of the Cunard liner FRANCONIA, launched by John Brown & Co. of Clyde Bank. The vessel has been specially designed for world touring, although when necessary it can be utilized for the transatlantic traffic. The vessel is 624 feet in length, 74 feet in breadth, 45 feet in depth, of 20,000 tons gross and 16 knots sea speed. Of her eight decks, seven will be given over to the use of passengers. She can accommodate 2160 passengers and crew.

* * *

IT IS understood in London that the Cunard Steamship Co. has made an arrangement with the soviet authorities whereby Cunard vessels trading in Russian ports will receive certain privileges and Russian vessels will have the use of Cunard docks and of the facilities in such ports as New York, Southhampton, Liverpool and elsewhere where the Cunard company has extensive properties. These arrangements are conditioned upon the eventual establishment of political recognition and it is believed they presage the extension of the Cunard services which are now operating between New York, Southampton and Hamburg to Petrograd and other ports of the eastern Baltic.

* * *

SEVERAL shipbuilding centers report a marked improvement in the orders given out during October, and there are signs of renewed activity at Birkenhead where Cammell Laird & Co. are laying keels for two new steamers to be used in connection with the West Indian fruit trade, each having a carrying capacity of 100,000 bunches of banamas. After a long period of almost complete idleness encouraging orders have been secured by shipbuilding yards on the Tees.

* * *

THE wage difficulty in the shipyards has been settled by the decision of a joint conference of shipbuilders and workpeople to divide the remaining 10 shillings reduction of the £1 6s 6d war bonus into four equal instalments to take effect on two dates in November, one date in December and finally on Jan. 3 next year. The matter has yet to be the subject of a ballot by the men, but it is expected that no opposition will be raised. Lord Inchcape in his speech at the annual meeting of the P. & O. company hinted that there would have to be considerable reductions in the wages of seamen, firemen and others if ships were to be kept running.

* * *

SO RECENTLY as Sept. 21, ex-Premier Lloyd George declined to receive a deputation at the instance of lord mayors and mayors representing eight steel and shipbuilding centers to urge upon him the desirability of proceeding at once with the building of two new battleships sanctioned by the Washington conference. Austen Chamberlain who was the spokesman for the prime minister said: "Having regard to the finance of the present year the government is not in a position to anticipate the date already fixed for laying down these ships." It is not without significance that the political turnover with its coincident announcement of the formation of a new government has also coincided with the issue of invitations to shipbuilders to tender for the construction of these battleships.

* * *

FOUR firms on the Clyde, namely the Fairfield Shipbuilding & Engineering Co. William Beardmore & Co. John Brown & Co. and Scotts Shipbuilding & Engineering Co.; three on the Tyne, Armstrong-Whitworth & Co., Swan, Hunter & Wigham-Richardson and Palmer's Shipbuilding Co., Jarrow, with such well known firms as Vickers of Barrow-in-Furness, Cammell Laird of Birkenhead, and Harland & Wolff of Belfast, have been asked to name prices on the new warships. The ships are to be of 35,000 tons, and will be heavily armed and protected. It is estimated that the total wage bill will be something like £6,000,000. The new government is doubtless justified in anticipating an increase of its popularity through the prospective giving out of this shipbuilding business.

* * *

ARMSTRONG-Whitworth & Co. of Newcastle-on-Tyne have secured the the order for the construction of the new floating dock at Southampton. The extension has been made necessary by the constant increase of inward and outward traffic, and the increasing size of the vessels to be accomodated. The dock will be the largest in the world, able to accomodate ships up to 60,000 tons burden having a length of 960 feet and a clear width of 134 feet. The gross weight of the whole dock will be 18,500 tons. It is to be built of steel, and will be held in position by four large steel mooring booms attached to concrete dolphins. It will be approached from the present docks by footbridges. This is merely the beginning of a large extension scheme intended to remove the present serious deficiences of Southhampton in relation to its traffic. At present there are six dry docks, but only one can accommodate liners of the size of the ACQUITANIA, OLYMPIC and BERENGARIA. At present it is impossible to dry dock the MAJESTIC which has a docking weight of 52,500 tons. The necessary dredging will involve the clearing of 860,000 cubic yards of mud.

* * *

NEW offices of the Port of London Authority on the left bank of the Thames were opened recently by Lloyd George, who was then prime minister, in the presence of numerous foreign ambassadors and members of the cabinet. The building, which is of a palatial character in the Corinthian style of architecture, has been erected on Tower Hill, and required about 10 years to complete. The most striking feature of the frontage is the rotunda 110 feet in diameter. The massive piers, classic columns and sculptured figures surrounding the main entrance give the building a most imposing appearance. The new premises are spacious enough to accomodate all the various administrative departments, thereby simplifying greatly the work of the authority. Lloyd George encouraged the visitors by predicting in terms of the utmost confidence a steady improvement in trade, which he compared to an incoming tide.

* * *

THE tankship SPIRILA, built for the Anglo-Saxon Petroleum Co. Ltd., London, by Swan, Hunter & Wigham Richardson, Ltd., Wallsend, England, has been delivered. She is a sister ship of the SCALAREA, built in 1921, and of the SOLEN, lately delivered. On her

trial trip the speed attained was 12.15 knots.

Built on the Isherwood system of longitudinal framing, the ship has nine oiltight holds, each of which is subdivided by an oiltight center bulkhead. Cofferdams separate this range of oil holds from the machinery and boiler space aft and from the cargo hold in the fore end of the ship. Pumps of the horizontal duplex benzine type are so arranged that oil can be pumped into any of the oil compartments or from any one of these into another on the opposite side of the ship. The pumps also are capable of discharging oil from the holds simultaneously over each side of the ship.

* * *

A GOOD example of the latest achievements in shipbuilding is the steamship BRITISH STATESMEN recently launched from the shipyard of Sir James Laing & Sons, Sunderland. This is the latest addition to the fleet of oil-carrying vessels owned by the British Tanker Co. Ltd., of London. The vessel is built on the longitudinal frame principle and is specially designed for the transportation of oil from the Persian gulf, being replete with up-to-date machines and appliances. Its length is 454 feet and its deadweight capacity 10,250 tons.

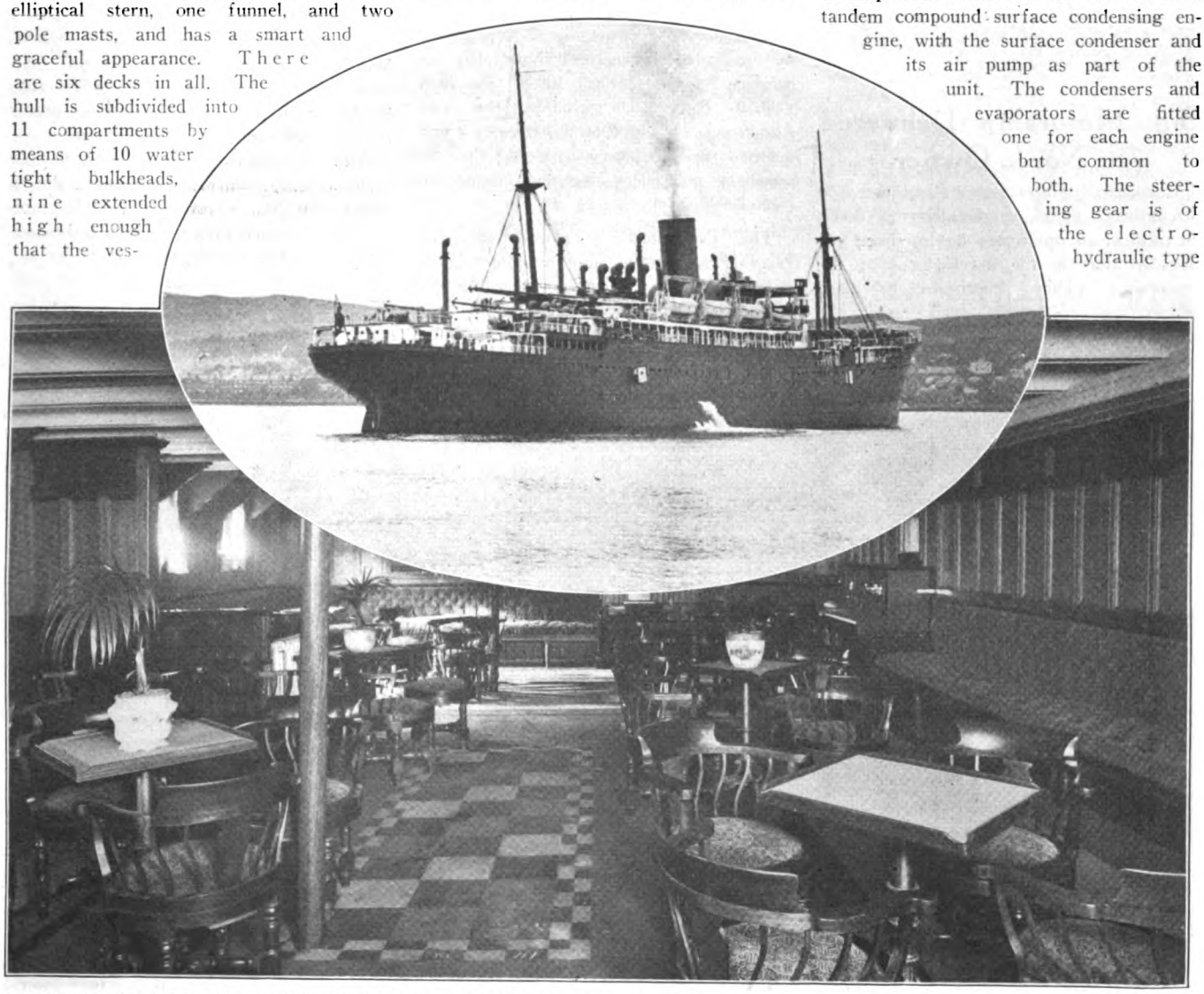
Scotch Yard Builds Australian Liner

COMPLETION of the steamship ESPERANCE BAY at the yard of William Beardmore & Co., on the Clyde has added to the Australian government fleet a modern vessel of 13,850 tons, 588 feet 9 inches long, 68 feet in beam and 43 feet 6 inches deep. She was built under Lloyds special survey to Class 100A1, the Australian regulations and the requirements of the convention on the safety of life at sea.

The vessel has a straight stem, elliptical stern, one funnel, and two pole masts, and has a smart and graceful appearance. There are six decks in all. The hull is subdivided into 11 compartments by means of 10 water tight bulkheads, nine extended high enough that the vessel will remain afloat with any two adjacent compartments open to the sea. Six cargo holds result, three forward and three aft of the machinery space.

For the rapid working of cargo 23 steam winches are provided, eighteen of which are 8 x 12 inches, two 6 x 10 inches and two 10 x 16 inches. One 35-ton steel derrick is fitted to the foremast for working No. 2 cargo hatch, and 18 5-ton and four 3-ton tubular steel derricks are fitted, four on the tables at each of the two masts and the remainder to the 10 derrick posts which are fitted with cowls to act as ventilators. In addition 3-ton electric cranes permit working No. 3 hold. A powerful steam windlass, is fitted on the forecastle and a 10 x 16-inch steam warping winch with extended ends also is used.

The refrigerating installation consists of two horizontal single marine type refrigerating machines, each machine having a compressor driven off the tail rod of a tandem compound surface condensing engine, with the surface condenser and its air pump as part of the unit. The condensers and evaporators are fitted one for each engine but common to both. The steering gear is of the electro-hydraulic type



LINER ESPERANCE BAY BUILT BY WILLIAM BEARDMORE & CO. LTD., DALMUIR, SCOTLAND, FOR THE AUSTRALIAN GOVERNMENT. LOWER VIEW SHOWS THE LOUNGE

consisting of two complete gears each operated by a variable delivery pump.

The electrical installation comprises two compound reciprocating engines driving two dynamos each of 125 kilowatt capacity. An emergency set of 35 kilowatt capacity, driven by a paraffin engine is also fitted. The main propelling machinery, consists of two sets of turbines driving twin screws through double reduction gears. The high pressure turbines rotate at 32,000 revolutions per minute, and the low pressure at 21,000 revolutions per minute and with gear reduction ratios of 35.5 and 23.4 respectively the propellers rotate at 90 revolutions per minute, the developed shaft horsepower being about 9000.

The designed speed fully loaded in service is 15 knots. The total power when going astern is about 60 to 65 per cent of the power going ahead.

The steam generating installation consists of three double-ended and two single-ended boilers of the Scotch cylindrical return tube type, all of 17 feet 6 inches diameter. The length of the double-ended boilers is 22 feet 6 inches that of the single-ended 11 feet 6 inches and all are fitted with smoke tube superheaters.

Big Motorship Delivered to Norse Owner

European shipowners continue to strengthen their motor-driven fleets, Scandinavian operators having been especially alert in the development of the motorship. They continued to place orders with the yards, even during the past depression. With the markets improving, some of these new ships are now becoming available for service. One of these, the THALATTA, has recently been delivered by Burmeister & Wain, Copenhagen, Denmark, to Wilhelm Wilhelmsen, Christiania, Norway.

The leading particulars of the vessel are:

Type of ship—Cargo, awning deck.
Length b. p.—425 feet, 5½ inches.
Breadth, molded—55 feet.
Depth—38 feet, 6 inches.
Draft, loaded—29 feet.
Displacement, loaded—14,995 tons.
Deadweight capacity—10,875 tons.
Stipulated normal average speed at sea—11¼ knots.
Stipulated normal consumption of fuel oil per day—10 tons.
Type of machinery—Burmeister & Wain's 6-cylinder, 4-cycle.
Number of main engines—Two.
Cylinder diameter—630 millimeters.
Stroke—960 millimeters.
Revolutons per minute—125.
Indicated horsepower—3100.

The trial results over the measured mile were:

Draft, average—9 feet, 6 inches.
Displacement—4345 tons.
Indicated horsepower average—3174.5.
Revolutions per minute, average—137.25.
Speed, average—12.11 knots.

Under test, the main engines developed 3178 indicated horsepower at 137.2 revolutions per minute, at a fuel oil consumption of 138.92 grammes or 0.3055 pounds per indicated horsepower hour, the net calorific value being 10049 kg. cal. (18050 B. t. u.) including the consumption of auxiliary engines producing the necessary current for the auxiliary machinery, steering engine and electric light.

The machinery is placed amidship. Loading and unloading is simplified by five large cargo hatches, served by 12 winches. The 5-ton after winch has warping ends, arranged on an elongated shaft to permit use as a warping winch.

The main engines are short stroke, forced lubricated crosshead engines, fitted on the front end with 3-stage air compressors supplying the necessary injection air for atomizing the fuel oil. All auxiliary machinery in the engine room as well as the deck machinery, is electrically driven, the necessary current being supplied by three 60 kilowatt, 220 volt diesel dynamos. For lighting purposes the current is transformed down to 110 volts by means of a motor generator.

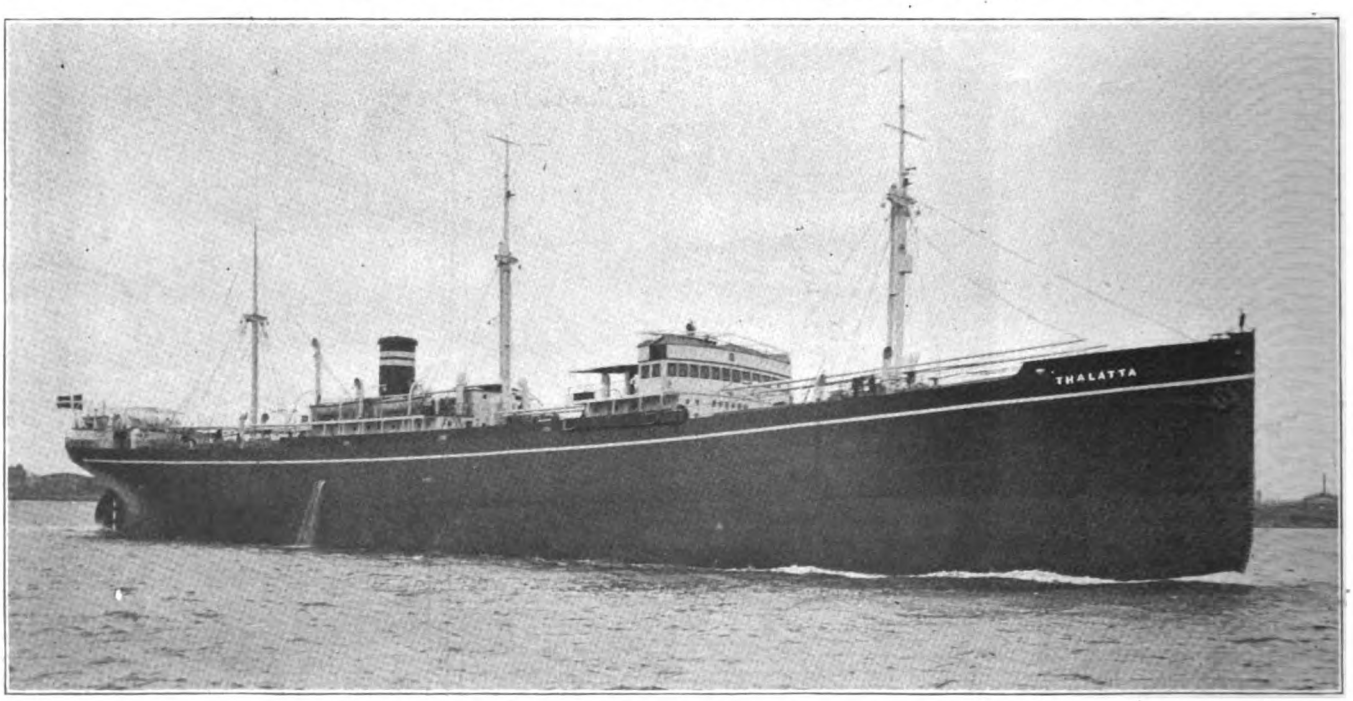
Each generator is sufficient for supplying the necessary current under normal working conditions at sea. Two or all three generators have to be started, when the consumption of current is large, for instance, when maneuvering with the maneuvering compressor running, or when loading or unloading with the winches in use.

For supplying steam for heating, a small boiler of 100 square feet heating surface, is used. This boiler also will deliver steam for fire extinguishing in holds.

The THALATTA is the forty-seventh motorship engined by Burmeister & Wain and the ninety-eighth motorship fitted with their diesel engines. This fleet totals 1,204,799 tons displacement with a total engine power of 296,330 indicated horsepower.

Although, the THALATTA is built for general cargo carrying purposes, she is fitted with four comfortable double stateerooms for passengers and a special stateroom for the owner.

The salmon pack of the North Pacific and Bering sea this year surpassed that of 1921 by 2,180,847 cases.



11,000-TON DIESEL DRIVEN FREIGHTER BUILT IN DENMARK

Attack Marine Insurance Clause

Brokers and Shipowners Criticize Proposed Tax on Foreign Policies—Believe Amended Model Bill Will Be Adopted

THE new model marine insurance bill, which was submitted to the state insurance commissioners at their annual meeting and approved by them, came in for considerable criticism at a special hearing by a subcommittee of commissioners in New York for the purpose of considering any objections to the proposed legislation. Opposition developed against particular clauses, especially one providing a tax of three per cent on brokers in this country who deal with unauthorized companies abroad. The tax was denounced by a spokesman for the brokers, who declared that such a provision was impracticable; could be circumvented; was calculated to handicap the marine insurance broker and would be an unjust imposition on the American broker, who often is unable to find sufficient facilities in this country to handle a line.

Ira A. Campbell, an attorney representing the American Shipowners association, also argued against the measure declaring such a tax would be an additional burden on American shipowners and was bound to have an adverse effect on the development of the American merchant marine. Mr. Campbell referred to the proposed tax as a protective tariff to make American vessel owners pay whatever insurance rates American insurance men demanded. He charged there was an evident attempt to build up American marine insurance before building up the American merchant marine.

William H. La Boyteaux, president of Johnson & Higgins, spokesman for the brokers, said his company did a large amount of business abroad. He declared he would prefer to do business with American companies and only placed business abroad when required to do so. During the hearing the question was raised as to what procedure is necessary in order to bring suit against foreign non-admitted companies abroad and if such procedure is not burdensome to the insured. Mr. Campbell informed the committee that actions in the British courts were handled more expeditiously than in this country and that only one action had to be brought to secure payments by a group of companies whereas here each company has often to be sued individually. Regarding the payment of losses, the representative of the shipowners declared that in his experience, foreign companies had been excellent settlers, suits against them rarely being necessary. Business goes abroad, he said, not because the American shipowner is any less patriotic than the foreigner, but because the American customer seeks a cheaper market.

In defense of the measure, one of the commissioners said he thought the three per cent tax provided for in the bill would not really be paid by the marine broker but would be passed on to the foreign insuring company.

The hearing was attended by a large number of marine insurance company executives, prominent brokers and several shipping men and explanations of numerous clauses were asked for. On the whole, however, the bill has the hearty support of the entire marine underwriting fraternity, and although a few changes may be made in details, it is likely to become law in a number of states.

Check Up on Lake Losses

WITH the closing of the Great Lakes season for wooden vessels on Nov. 1 marine insurance underwriters have begun to check up on their experience for 1922. Indications are they have done decidedly better than last year with respect particularly to claims paid out for the cost of repairs. Although average hull losses are thought to be about the same as 1921 the cost of repairs in the Great Lakes yards has dropped considerably. As the season for other navigation does not close until Dec. 12 there is still time for a bad storm to sweep across the lakes and do tremendous damage, upsetting the comfortable calculations of optimistic underwriters.

Cuts Risk Rate on Burlap

BURLAP is the latest commodity insured under a tariff agreement among underwriters to become the subject of a threatened rate slashing war. It is reported one company member of a large association without notice proceeded to cut its rate on burlap and then started a canvass for accounts held by other members of the group. The action of the independent company is causing a great deal of resentment and as a result, a special committee of underwriters has been appointed to investigate and recommend action for the association to take to draw the offending company into line. It is suggested the other members of the association make a similar reduction in the rate which will result in the unruly company gaining nothing by its venture.

Cuba May Adopt U. S. Law

SUPERVISION of marine insurance companies as provided by law in this country will be followed in Cuba if a bill for the regulation of insurance in the island is enacted by the congress of that country. A bill which has as its purpose the placing of insurance under the direct supervision of the government is now pending and if passed will place the marine insurance business in that country on a staple basis. The bill provides that Cuban companies shall have a minimum capital of $200,000, the entire amount being invested in Cuban securities and maintained at the market price. A tax of five per cent would be imposed upon premiums and companies would be required to have an unearned premium reserve of 50 per cent of the premium irrespective of the term. The bill provides for creation of an insurance department with a superintendent of insurance as a bureau of the treasury department and for the periodical examination of companies.

Near East Gets War Rates

THE situation in the Near East continues to be watched carefully by marine underwriters. War rates have been quoted freely in the New York market at one half per cent to Greek ports and two per cent to Constantinople. Some underwriters have refused to write any business to Constantinople because of the possibility of a blockade making it necessary for vessels to discharge at a port other than that of destination. This would involve considerable expense, and while underwriters claim that under war risk clauses, they are not liable for such loss yet it is well known that during the world war such claims as this were paid. The clause generally used in American policy forms provides:

Excluding claims for delay, deterioration and loss of market and warranted not to abandon in case of capture, seizure, or detention, until after condemnation of the property insured nor until 60 days after notice of said condemnation is given to these assurers. Also warranted not to abandon in case of blockade, and free from any claim for loss or expense in consequence of blockade or of any attempt to evade blockade, but in event of blockade, to be

at liberty to proceed to an open port and there end the voyage.

Pilferage Losses Greater

THEFT and pilferage losses which under continual fire seemed to have decreased during the past six months suddenly have jumped with the result that underwriters, who had let up their barriers and were writing the business with less care, have been experiencing a flood of claims. A few companies steadfastly have refused to touch a theft and pilferage risk and these are congratulating themselves on their foresight. Underwriters who have been writing this class of business subject to all risks at from 15 to 20 cents per 100 are watching their claim departments work overtime. It is understood that the majority of claims now being received are on imports from Europe.

Protest Tax on Repairs

THE new tariff act is likely to prove a boomerang to American marine underwriters, particularly as regards the tax of 50 per cent on the cost of repairs to vessels of American registry when effected abroad unless caused by the stress of weather, according to prominent marine insurance officials. This feature of the act is spoken of in underwriting circles as an outrage and it is generally felt that it will be a serious handicap to the extension of the American merchant marine. A British insurance journal which has reached this country comments on the clause as follows:

> Underwriters who are interested in American hulls have been astonished to learn that the new American tariff provides for an ad valorem tax of 50 per cent on the cost of all ship repairs effected to American vessels abroad, unless caused by the stress of weather. The penalty for non-disclosure is the confiscation of the vessel. It is now being debated whether, in the case of a claim for repairs on which the tax is collectible underwriters can be asked to pay the tax. American repairs are more expensive than those carried out by European repairers and underwriters on American hulls generally ask for repairs to be carried out on this side of the Atlantic if possible.

Worry Over Grain Tie-Up

UNDERWRITERS are concerned over the concentration of risks at Buffalo due to congestion in the movement of grain. A number of vessels have been tied up there for indefinite periods through which demurrage charges have been accumulating. The cause of the tie-up is blamed upon the shortage of cars for transporting grain to the Atlantic seaboard and the priority which is being given to coal movements. Because coal is getting the right of way, elevators are packed to their roofs. It is estimated that there are between 16,000,000 and 17,000,000 bushels of grain in Buffalo elevators and little facility for its handling. Underwriters are afraid that unless the bulk can be moved before the lakes freeze large claims will be pouring in.

Buffalo Builder Enters Diesel Field

NEW designs in diesel engines are being brought out from time to time as this type of ship propulsion is becoming more widely used. Active developments in the engine building industry naturally appear more frequently in these newer types as manufacturers add or change over to this product. Among the latest manufacturers of diesel equipment for smaller sizes of boats is the H. G. Trout Co., 220-248 Ohio street, Buffalo, founder and machinist, which has been engaged in building marine engines and propeller wheels for a number of years.

Several sizes of diesel engines are being built by this company. Three of these are to have cylinders 8¼ x 12 inches rated at 25 brake horsepower per cylinder at 350 revolutions per minute; three of 11½ x 18 inches rated at 50 brake horsepower per cylinder at 250 revolutions per minute; and three of 14¼ x 21 inches rated at 80 brake horsepower per cylinder at 220 revolutions per minute.

The smallest engines, shown in Figs. 1 and 2, are in 3, 4 and 6-cylinder sizes, each engine having adjustable babbitted double collar thrust bearings, Snow & Petrelli Mfg. Co. reverse gear, starting air valve on after cylinder and one-piece frame with cylinder in one piece without removable liner.

The next larger size engines also are of 3, 4 and 6 cylinders. They have Kingsbury thrust bearings, direct reversing control mechanism, and 3-piece frame consisting of bed plate and two side halves of upper frame. One of these sides may be removed by taking out the through

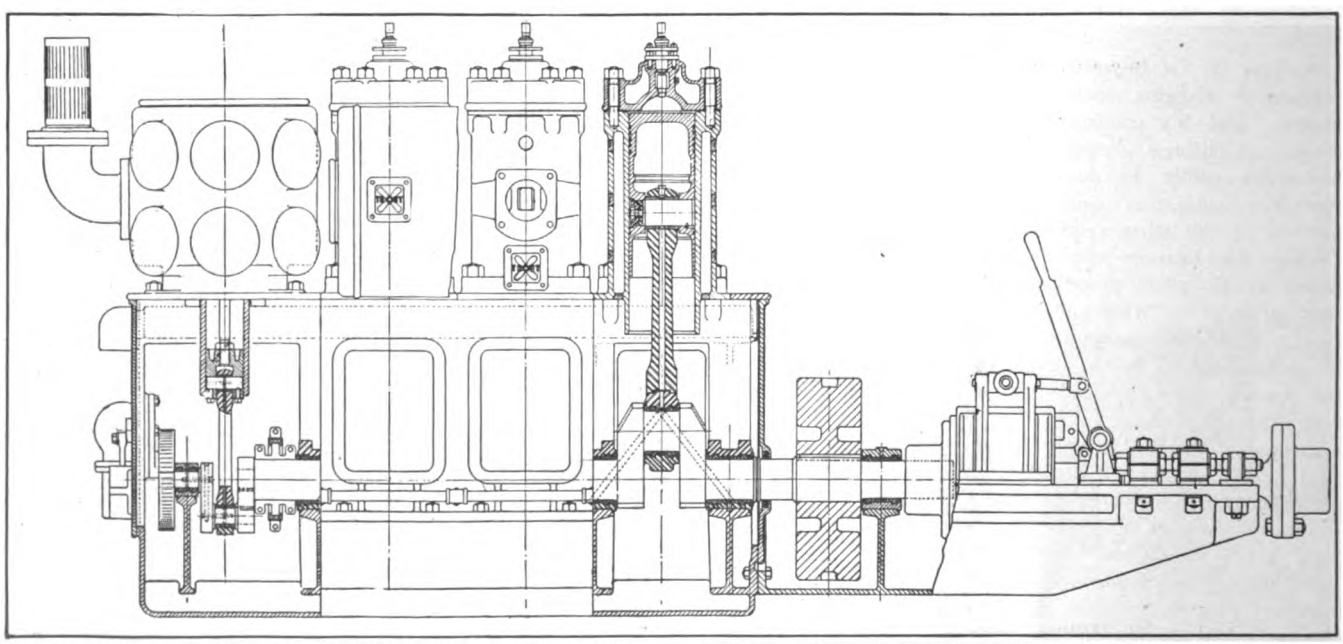


FIG. 1—NEW MARINE DIESEL ENGINE, BUILT BY TROUT CO. IN SIZES RANGING FROM 75 BRAKE HORSEPOWER 3-CYLINDERS TO 480 BRAKE HORSEPOWER 6-CYLINDERS

bolts which hold the cylinders to the bed plate and shoring up the cylinder, enabling the crankshaft to be removed, with cylinder jacket and liner separate.

The largest engines also are made in 3, 4 and 6-cylinder sizes with specifications the same as for the 11½ x 18-inch type.

On all of these engines, the scavenging pump piston displacement equals 150 per cent of the power piston displacement. Circulation of the lubricant is through holes in the crankshaft with provision made for continuous filtration of the lubricating oil. The top of each frame has a scavenging air receiver cast integrally.

The fuel pump has an eccentric drive timed to inject fuel at 20 degrees before dead center. There is a double eccentric controlled fulcrum for the trip lever, a hand lever controlling one eccentric and the governor the other. With the hand control at full load position, the governor can shut off the fuel entirely, while in opposite positions the hand lever can shut off the fuel. The control as shown in Fig. 3 consists in the trip lever fulcrum being so located that the trip will hit the suction valve and open it against pump pressure at any desired point in the stroke of the plunger. In the smallest engines, the plunger stroke is about 1/16-inch. The plunger is pulled down from the top of the stroke by an adjustable catch near the end of the down stroke and then rests on a stop until the tappet hits it near the end of the up stroke. The tappet and catch are fastened to the crosshead of the pump eccentric strap. There is a hand primer pump for each cylinder to fill the lines with fuel before starting the engine.

Directions For Starting

The control mechanism for the direct reversing engines is confined to a single motion of each of two levers. When the fuel control lever is in the off position a dog engages the starting air lever. To start the engine, this lever is pushed up through a few degrees of its arc of travel. The first action is to raise the stem of the pilot valve, opening the pressure equalizer which is a part of this stem.

This action allows the air pressure to get under the main valve and assist the operator to open it as he moves the control lever a little further. When this valve is open, the air is allowed to flow to the distributing valves, one for each cylinder, closing all of them except the one held open by its cam. The air passing this valve goes to the corresponding cylinder through a check valve in the cylinder head, starting the engine. When the engine has come up to speed, the control lever is pushed further over. Just before it reaches the position where it can allow fuel to be pumped to the cylinders, the dog is tripped and releases the starting air lever which is returned to its original position by a spring. This closes the pilot valve.

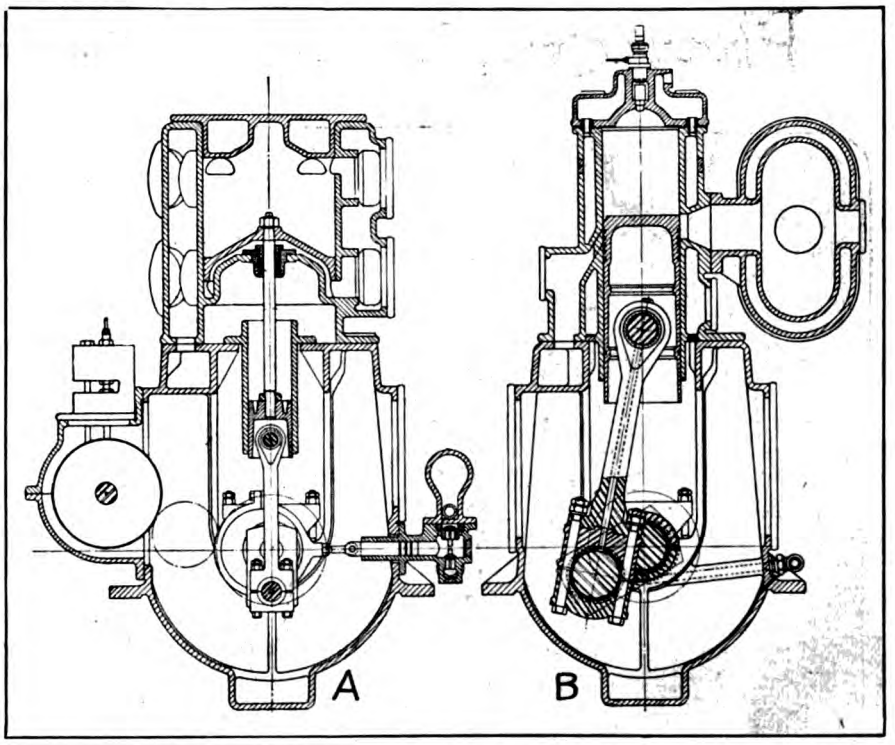


FIG. 2 (A)—SECTION THROUGH SCAVENGING PUMP CHAMBER. (B)—SECTION THROUGH WORKING CYLINDER

When the main pilot valve is closed, it uncovers an outlet to the atmosphere which allows the pressure under the distributing valves to drop and the valves stay down and open when pushed down by a single revolution of the cam shaft. To reverse the engine, the other lever is thrown in the opposite direction, shifting the starting cam sleeve along the shaft and bringing another set of cams over the distributing valve stems. Then the fuel control lever is brought to the off position and pushed forward again to start the engine as before but in the opposite direction. The reverse lever can be thrown at any time except while the starting air pressure is on the distributing valve. When the pressure is on this valve, all valve stems are up, except the one in contact with a cam. Therefore, some one of the reverse cams are certain to foul one of the stems and prevent the movement of the lever.

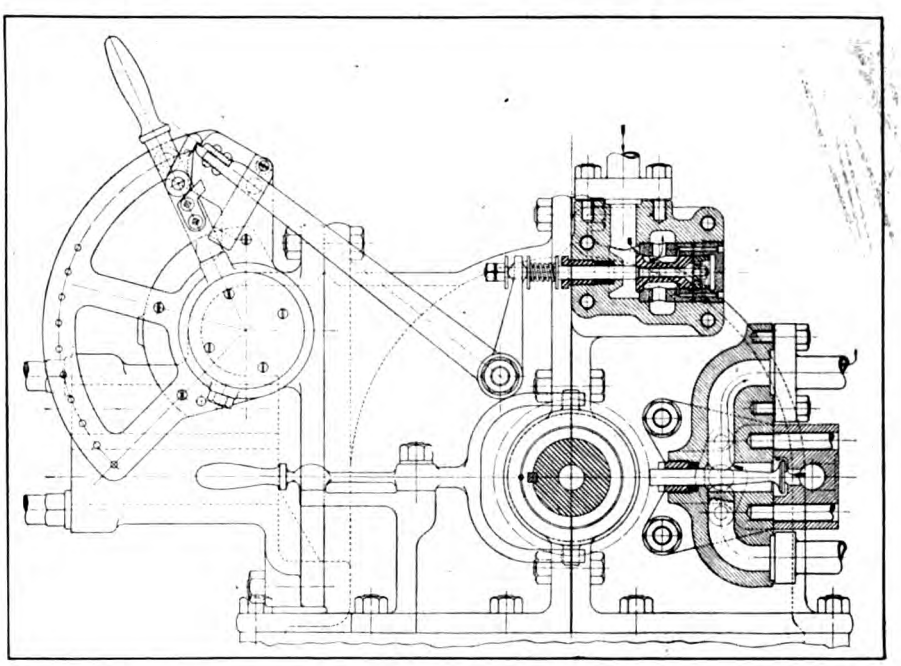
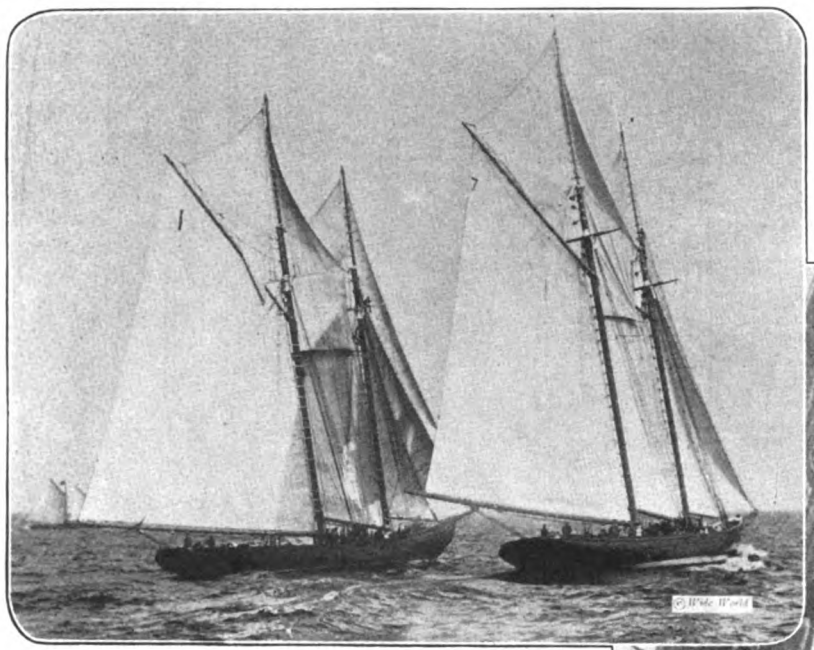


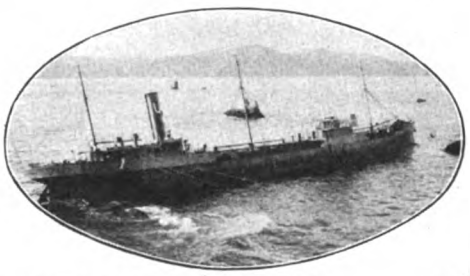
FIG. 3—SHOWING DIRECT REVERSING CONTROL MECHANISM

Photographs from Far and Near



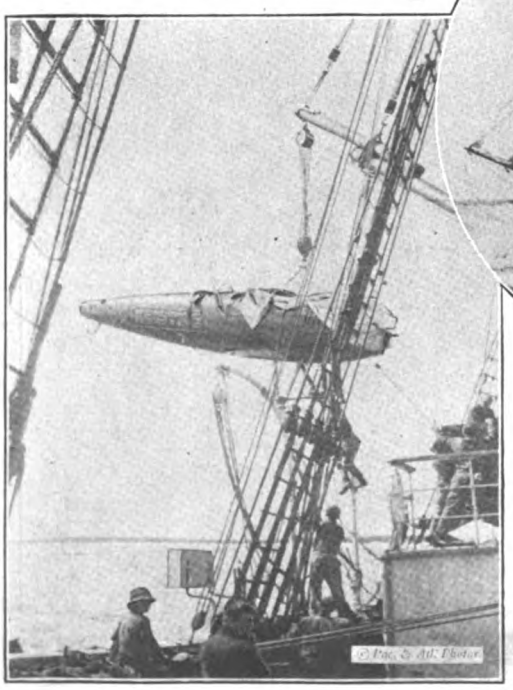
The Henry Ford, at the right, winning over Bluenose in the international fishermen's race off Cape Ann

Here is a group of photographs, the first to reach the outside world, of Captain Amundsen and his hardy associates since they entered the frozen Arctic. Eskimoes who helped load the Maud, Amundsen's ship, are seen going aboard the Holmes, which rendered great aid to his party.



Tanker Lyman Stewart wrecked in head-on collision with the Walter A. Luckenbach, north channel, Golden Gate

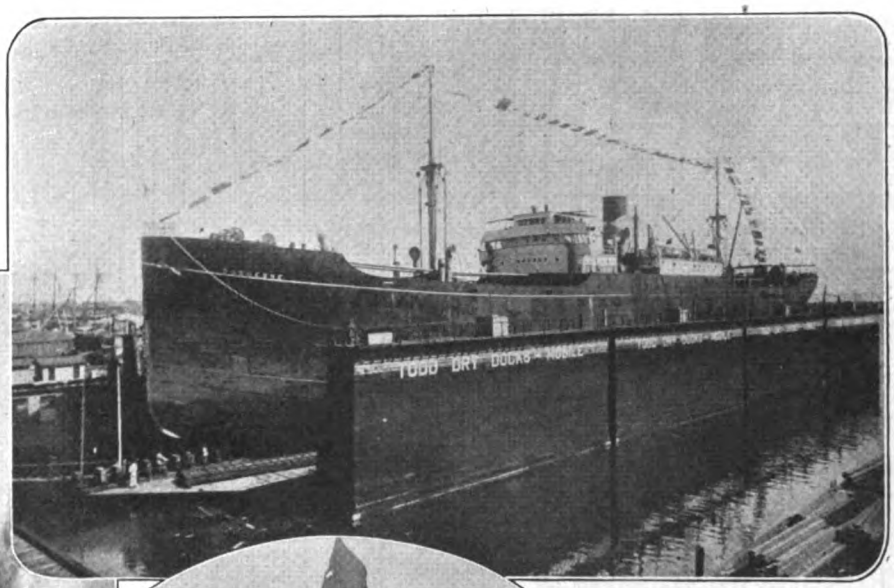
This photograph shows Captain Amundsen in his sealskin suit, with his associates. At the left is the Maud wedged in the ice, 80 miles from Point Barrow

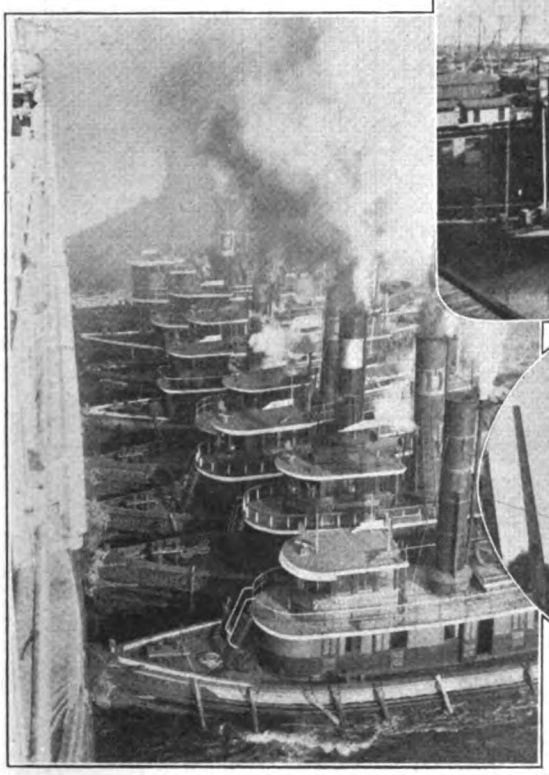


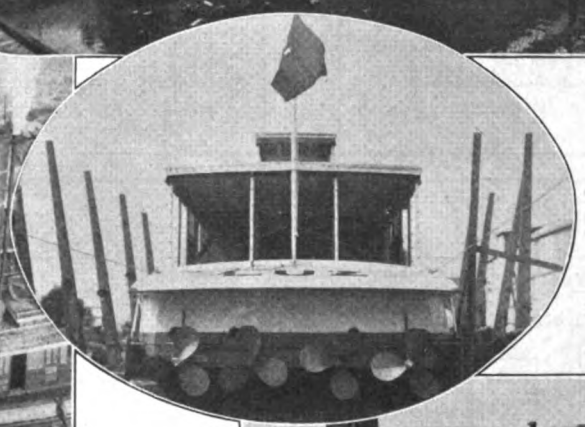
The photograph at the left shows the smaller of two airplanes being lowered from Amundsen's ship, to be assembled for flight to Point Barrow. Amundsen is to use a larger all-metal plane in his attempted flight over the pole

Latest Marine News in Pictures

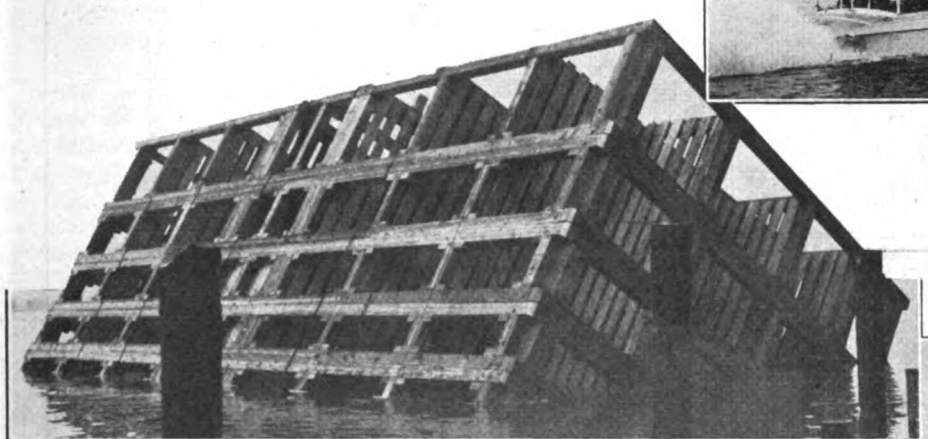
Eighteen tugs were required to nose the giant liner Majestic into her pier on North River, because of high wind and tidc. Nine tugs are shown here, lined up on one side



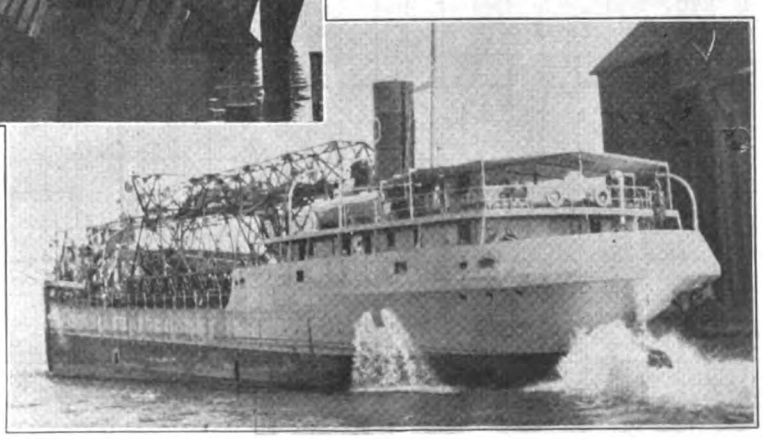




Raising of the steamer Duquesne on the new 10,000-ton drydock was the main feature of the celebration marking the recent opening of the Mobile plant of the Todd Shipyards Corp.

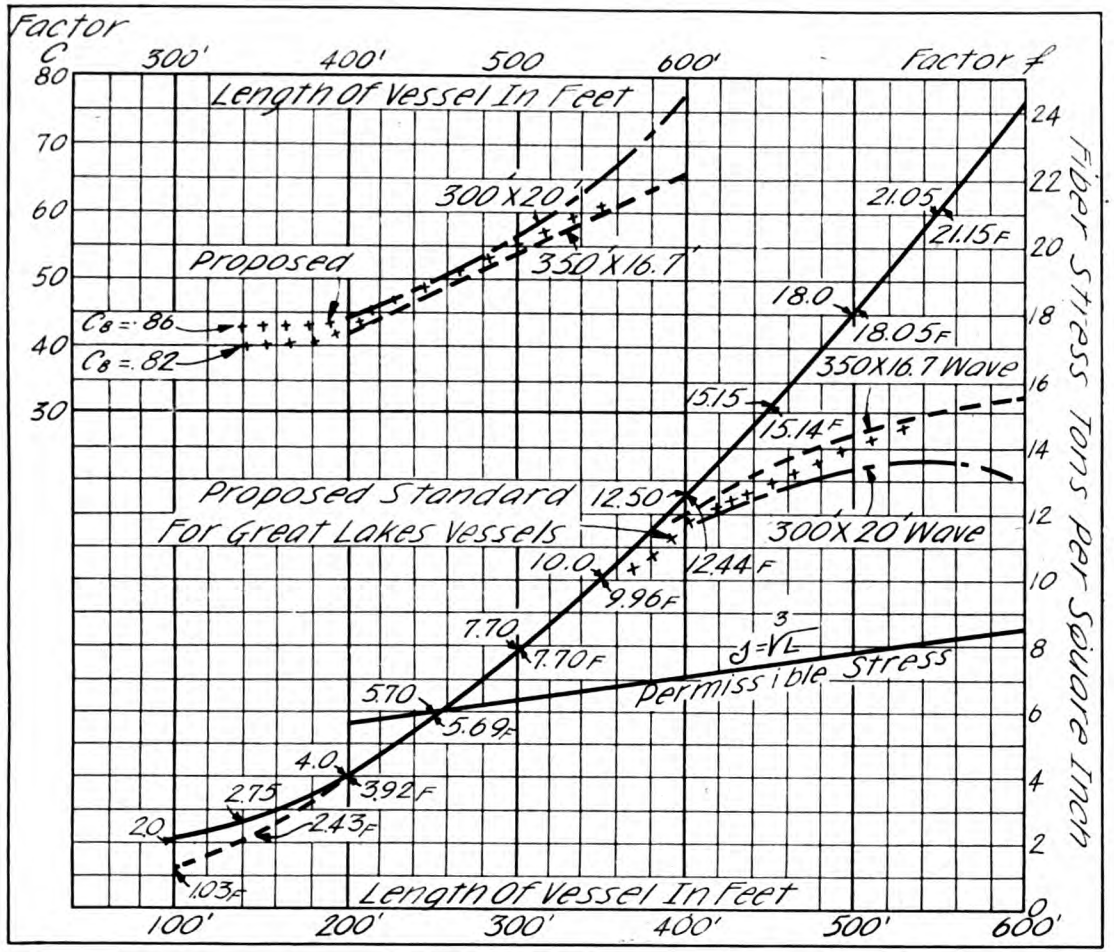


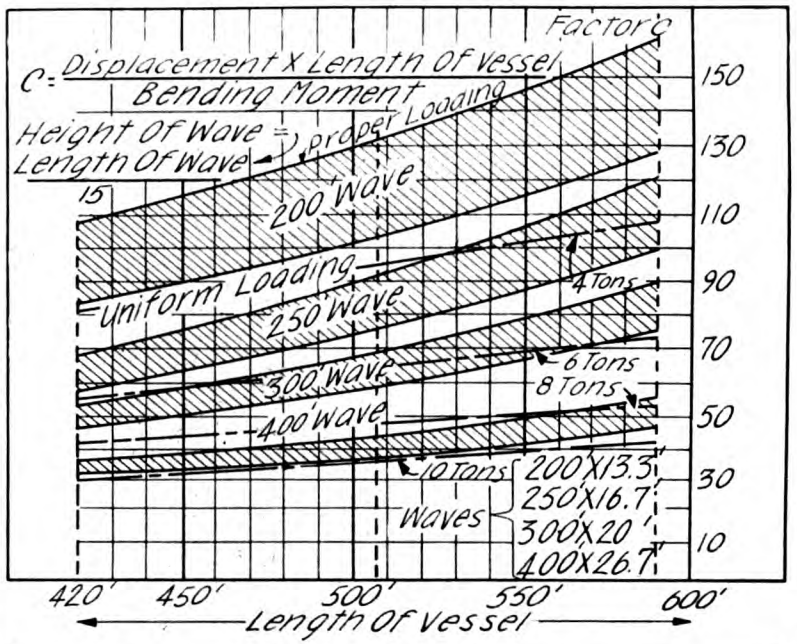
This sea sled, built by SeaSled Co. Ltd., West Mystic, Conn., for Transportes Rapidos Fluviales, for use on the Magdalena river, Colombia, recently made 180 miles in 7 hours. The boat is designed to carry 20 to 30 people

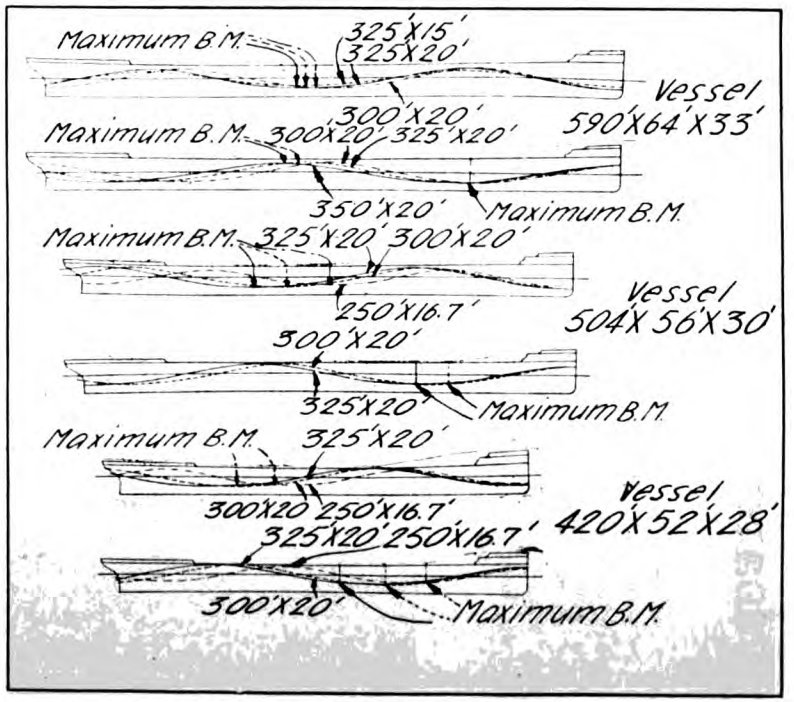


A wooden crib, 93 x 43 x 36 feet, recently was launched by the Marine Construction Co., Seattle, for use as a cofferdam for a bridge pier

The Collingwood Shipbuilding Co., recently launched the Charles Dick for the National Sand & Material Co., Welland, Ont. This vessel is the only one of her class built in Canada, and has the most modern equipment







Definitions

$\frac{I}{y} = f \times d \times B$

$\frac{I}{y}$ = Longitudinal Modulus Of Resistance

f = Longitudinal Strength Factor

d = Draft Of Vessel

B = Breadth Of Vessel

F = Computed By Formula

C_B = Block Coefficient

C_{UB} = Cubic Feet Of Water Per Ton

35 For Salt And 36 For Fresh Water

C = Bending Moment Factor

$C = \frac{\text{Displacement X Length}}{\text{Bending Moment}}$

L = Length Of Vessel

$f = \frac{C_B}{C_{UB} \times C} \times L^{\frac{5}{3}}$

$f = .000573\, L^{\frac{5}{3}}$ IF { Salt Water C_B = .78, C = 39 }

$f = \frac{.0239\, L^{\frac{5}{3}}}{C}$ Fresh Water IF C_B = .86

FIG. 1 (ABOVE)—TABLE SHOWING STANDARD OF STRENGTH FOR LAKE VESSELS. FIG. 2 (UPPER RIGHT)—BENDING MOMENT FACTORS AND CORRESPONDING FIBER STRESS.
FIG. 3 (LOWER RIGHT) WAVE PROFILES AND RESULTING POSITIONS OF MAXIMUM BENDING MOMENTS

Lake Ships Stronger Than Ocean

Study of Effects of Waves on Freighters Favors Fresh Water Craft—250 Feet Maximum Wave Length

BY PROF. HERBERT C. SADLER AND PROF. A. LINDBLAD

WHEN the committee on bulkheads and freeboard met to consider the various problems upon which it was to report, the question of the possibility of including the vessels on the Great Lakes in the assignment of freeboard arose. As little or no systematic investigation into the strength of this type of vessel had been made, it became necessary to make several strength calculations for the conditions met with in this region. As information of this character may prove of value in other fields, it was thought advisable to have it in the permanent records of the society. The results of the principal parts of these investigations are submitted herewith.

In the first place, it became necessary to find out what lengths and heights of waves might be expected. Little or no data upon this subject existed, so a series of instructions was issued to captains of vessels in order that they might observe and report upon the waves encountered. Although all possible care was taken on the part of the observers, there was still a chance of error. On the whole, however, the data obtained were sufficiently reliable for the purpose in hand. A few of the general conclusions are as follows:

1. As a rule, waves over 250 feet in length are rarely encountered. In one case, a report was made of waves in the neighborhood of 350 to 400 feet after a severe storm on Lake Superior, but although the height was not observed it was evidently not of the usual magnitude, judging from other comments on the behavior of the ship.

2. The heights of the waves appear to be somewhat larger in proportion to their lengths than the usual ratio of 1 to 20, and probably vary between this figure and 1 to 15. The actual heights did not appear to exceed 20 feet as a maximum. The following waves therefore were used in the calculations: (*a*) 325 feet by 20 feet; (*b*) 300 feet by 20 feet; (*c*) 250 feet by 16.7 feet and two special cases, 325 feet by 15 feet and 350 feet by 20 feet, in order to obtain some intermediate data. As these waves are considerably shorter than the usual run of vessels on the lakes today, it was necessary to perform two sets of calculations, one with the crest and one with the hollow at the bow of the ship.

Three types of vessels were chosen of the following dimensions: (*a*) 420 feet by 52 feet by 28 feet; (*b*) 504 feet by 56 feet by 30 feet; and (*c*) 590 feet by 64 feet by 33 feet.

The wave profiles and corresponding positions of maximum bending moment are shown in Fig. 3 for all of the above cases. As these vessels tend to sag when uniformly loaded, it is customary to put some additional cargo in the forward and after ends. This method of loading has been assumed as the proper one, although calculations were also made for uniform loading. It will be noticed that both the magnitude and position of the maximum bending moment depend upon whether the crest or hollow is assumed at the bow, and also that it depends upon the wave dimensions. If the effect of varying heights of waves of the same length is desired, it was found that, for moderate changes, the bending moment varies as the square root of the height.

The results have been summarized in Fig. 2 in the form of bending moment factors.

While the foregoing may be considered as general data with regard to bending moments on vessels, it may be of interest to add the special application in the determination of the strength of lake vessels.

If we take the form proposed by the British committee on freeboard as representing the strength, viz., $\frac{I}{y}$ = f. d. B. the following may be developed:

If s = stress, BM = bending moment, Δ = displacement, C = bending moment factor, and C_b = block coefficient:

$$\frac{I}{y} \times s = BM = \frac{\Delta \times L}{C},$$

$$\text{f. d. B.} \times s = \frac{\text{L. B. d.} \times C_b}{35} \times \frac{L}{C};$$

and if we assume $s = \sqrt[3]{L}$,

$$f = \frac{C_b}{35\ C} \times L^{5/3} \text{ for salt water}$$

$$= \frac{C_b}{36\ C} \times L^{5/3} \text{ for fresh water.}$$

The proposed values of f are shown in Fig. 1. It is obvious that if the waves on the lakes do not exceed a certain definite length, the value of f should show a falling off after this length is reached. This is indicated on the curves, and it is interesting to note that numbers of the present vessels, especially the larger ones, show an excess of the above values; or, in other words, from a strength point of view, they could be loaded deeper than the present depth of water available allows.

In conclusion, and in light of the investigations, it appears that the lake freighters of today are, for their service, as strong as, if not stronger, than similar ocean-going types, and the statement that these vessels are weaker is not borne out by theoretical investigation or practical operation.

The authors are members of the Society of Naval Architects and Marine Engineers. The paper was read at the thirtieth general meeting of the society in New York, Nov. 8 and 9.

Establish New Line To Run to Orient

Organization of the Admiral Oriental line, a new corporation to operate the five fast shipping board passenger liners and four freighters assigned to the Puget sound-Oriental route, has been completed. The following officers are announced: R. Stanley Dollar, president; J. Harold Dollar, vice president; H. M. Lorber, vice president; A. F. Haines, Seattle, vice president; and Merrill Robinson, secretary.

The Pacific Steamship Co., known as the Admiral line, has acted as operating agents for the government's Oriental fleet, in conjunction with the company's other services. According to announcement by President Lasker, of the shipping board, it was deemed advisable to have a separate company whose officials could give their entire time to developing a permanent American line between Seattle and the Far East. Consequently the division was decided upon leaving the officials of the Pacific Steamship Co. free to give all their attention to the coastwise services now operated by that company.

Llewellyn D. Lothrop, Gloucester, Mass., died recently at Boston. He was the inventor of mechanical fog horn widely used on vessels. For many years, he had been a ship chandler.

Editorial

Standardization Means Economy

MERCHANT ships of all nations operated during the war and for two years after the war with great profit. The business of the merchant marine flourished as never before. In the United States, the contrast between this boom period and the lean years of 1914 and before was particularly great. Poorly equipped personnel was at a premium. Men who before the war were quartermasters or third officers, oilers or third engineers, easily obtained ships as masters or chief engineers before the end of 1919.

It is old and it is fundamental that nothing easily obtained is duly appreciated. Few of the quickly promoted officers appreciated their good fortune or the responsibilities entailed when they were placed in command. The result was a poorly disciplined ship, slackness, waste, extravagance and neglect of even the plain ordinary duties.

This period has passed. Once again a choice can be made of men for responsible positions based on their fitness. The gross losses in cost of operation have long ago ceased. Ships are now running with prewar care at least. The setback in shipping may be a blessing in disguise, for it has caused the experienced operators (any others have long since been eliminated) to face squarely the problem of stoppage of all waste and to secure economy in every department. The margin of profit is small and nothing must be expended that does not show a proportionate return.

The mood then today of the ship owners, ship operators, shipbuilders, shippers and manufacturers looking to this industry for their business, is eagerly receptive to any practical method of waste elimination, saving of first cost, cost of upkeep and cost of operation. Standardization, the new battle cry which really means arriving at the best way to do a thing and then have everyone adopt that way and stick to it, has been used in other industries with notable success. England and Germany already are applying this method of saving to the shipping industry.

As a nation, we may lay some just claim to the qualities of energy, initiative, organizing ability and team play. Are we to allow other nations to lead in this instance? A study of the application of standardization to the marine industry is already under way. Secretary Hoover called an informal conference of men interested in the industry which was held under the auspices of the American Marine association in New York on Nov. 10.

Practical difficulties will arise in the application of standardization to an industry so diversified Different great companies after spending time and money in perfecting their product or their method of doing business will be reluctant to give up their own way and are likely to want their way adopted as standard. No attempt should be made to disturb too suddenly methods now in use. Gradually better or standard methods can be introduced when scrapping the old equipment will show a profit.

Nothing of value can be accomplished along this line unless there is the fullest co-operation on the part of the leading shipyards, steamship companies, equipment manufacturers, builders of main and auxiliary marine engines, the government as represented by its different bureaus having to do with laws and regulations controlling the merchant marine, the classification societies and the personnel both afloat and ashore who are working not only for wages but with a genuine desire to keep the American flag on the seas. Everybody must help.

Fuel Conservation on Ships

METHODS of standardization have already been put to a practical test in an important factor in the shipping industry, that is, fuel conservation on board ship. A committees of practical men was recently appointed by Joseph E. Sheedy, vice president of the Emergency Fleet corporation, to study this question with the view of making practical recommendations.

Its first step was to classify the active shipping board fleet according to similarity of type and machinery, as far as possible. The next step was to set up some standard of comparison of fuel consumption. The practical figure finally adopted was mileage per ton of fuel.

An interesting study has been made by this committee of one class of ships, the 502-foot passenger and cargo vessels of the type of the PRESIDENT POLK. Curves developed from the brake horsepower runs of the model experiments were worked out and modified in such a way that they represent average possible performance of this type. When comparisons were made with the actual performance of these seven vessels, an average efficiency of 92 per cent was found while the best showing was found to be 105 per cent. The causes for variation in efficiency can be and will be eliminated.

Work of this character is of practical benefit as now a standard has been set up for this class which will determine whether or not the possible efficiencies are maintained. More of this sort of standardization will be of great value in showing where any particular ship stands as to fuel efficiency and thus enabling owners to recognize and correct poor performance.

Marine News in a Personal Way

Intimate Gossip About What Leaders in the Maritime World Are Doing

BERRY E. DUNN has been appointed San Francisco representative of the Los Angeles Shipbuilding & Drydock Corp., with headquarters in the Balfour building. Mr. Dunn for the past year engaged in private practice as a consulting engineer, was for many years in the engineering department of the Union Iron Works, now the Bethlehem Shipbuilding Corp. Then he took charge of the engineering department of the city of San Francisco from 1915 to 1918, thereafter becoming technical engineer for the Pacific division of the shipping moard, with headquarters in San Francisco.

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WILLIAM G. COXE, vice president and general manager of the Pusey & Jones Co., Wilmington, Del., and marine consulting engineer with offices in Philadelphia, returned from Europe early in November.

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C. H. COLTON has been appointed chief engineer and purchasing agent of the Chicago Steamship Lines, Inc., with office at Municipal pier, Chicago.

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CAPT. ASA DAVISON, general manager of the marine department of the United Fruit Co., has been nominated for the board of managers and committees of the American Bureau of Shipping. Captain Davison is a member of the committee on navigation and maritime legislation of the Maritime association, Boston chamber of commerce.

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CAPT. CHARLES F. OSBORNE, commander of the Anchor Line steamship ASSYRIA, will retire after making a trip to the Far East in command of the steamer CIRCASSIA. CAPT. W. B. ROME will succeed Captain Osborne.

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NORRIS R. SIBLEY, who has been in charge of the Westinghouse Electric & Mfg. Co.'s marine department in New York for several years, has resigned to become New York district manager for the London Steam Turbine Co., Troy, N. Y. Mr. Sibley has served as assistant and chief engineer in several of the lines of the merchant marine, including the American line, Clyde line, Mallory line, Southern Pacific, Panama line, Luckenbach line, Benvenue Granite Co., and Metropolitan Dredging Co. His office will be in New York city.

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H. W. PARSONS, formerly with the marine department of the General Electric Co. has joined the marine department of the Power Specialty Co. to assist in giving service on the company's marine superheater and marine boiler. His headquarters are at 111 Broadway, New York.

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S. A. DUNLAP, who has been the chief clerk in the Galveston office of the Texas Transport & Terminal Co., for a number of years has been transferred to Houston, Tex., as agent for the purpose of opening up a new office in that port.

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C. O. BURGEN, of San Francisco, former general freight agent of the Atlantic, Gulf & Pacific Steamship Co., has joined the traffic department of the General Steamship Corp. He was with the Luckenbach Steamship Co., before going with the Atlantic, Gulf & Pacific.

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O. L. SMITH, JR., formerly manager of the Black Diamond Steamship Co., at Baltimore, has been transferred to New York as assistant to the president. P. G. MC INTYRE, assistant manager, takes his place. Mr. McIntyre is also president of the Baltimore Foreign Trade club.

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J. H. WALSH, general manager, and TILEY S. MCCHESNEY, assistant general manager of the New Orleans port commission, were elected first vice president and secretary, respectively, of the American Society of Port Officials at the recent convention in Toronto.

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P. F. TUNISON, formerly general manager of the New York & Argentine Steamship Co., and FREDERICK A. KIRK, formerly of Kirk & Treene, Inc., have formed a co-partnership as Kirk & Tunison to do a general ship, freight brokerage and chartering business.

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ARTHUR A. GRANT, who as vice president and southern director of the Sinclair Refining Co., handled that company's oil tankers, cargo ships and barges at New Orleans, has become general manager of Jahncke Dry Docks, Inc. Mr. Grant was with the shipping board and had charge of re-conditioning interned vessels during the war. He was with the Todd Dry Dock & Shipping Co. for 10 years at New York and was confidential advisor to the Morse Dry Dock & Shipbuilding Co.

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A. P. ALLEN has resigned as manager of sales and repairs of the Federal Shipbuilding Co., 26 Beaver street. New York. A. C. ROHN is acting manager of sales and repairs.

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CAPT. JOHN F. BLAIN, who attained prominence during the war as head of the Emergency Fleet corporation in the northwest Pacific district, has been appointed northwest representative of the Bethlehem Shipbuilding Corp., Bethlehem, Pa., and allied interests.

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M. J. WRIGHT has been appointed district manager of the Luckenbach Steamship Co., with headquarters at Seattle, succeeding R. S. JAMES, who resigned Nov. 1. Mr. Wright resigned as assistant to A. F. HAINES, vice president of the Admiral Oriental line.

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JOHN GAMMIE has just been made manager of the Cunard, Anchor and Anchor-Donaldson lines in Chicago, succeeding F. G. WHITING, who has retired after 50 years of service with the Cunard interests. C. W. KENICK, who has been associated with Mr. Gammie, both with the British ministry of shipping and with the Cunard company, succeeds him as freight manager. Mr. Gammie is 30 years old. He was born in Glasgow, Scotland, and was trained in the shipping business as an apprentice to a Scottish company. For three years, he was associated with the British ministry of shipping handling cargo lines from this country to France, England and the Mediterranean. He acted as British consul at Newport News, Va. His success in handling ships and their cargoes led to his being offered a position as head of the Cunard line's American-Rotterdam service. Gradually other lines were placed under his supervision and in 1921 he was made manager in this country of all of the company's freight services. In his new office, he will handle a large proportion of the company's traffic.

Montreal's Closing Will Aid Boston Trade

At Boston inbound freight has materially increased during the past month, but exports continue low, and many vessels unloading at Boston have had to touch at other ports in order to complete return cargoes. At this time of year considerable interest centers in the closing of the port of Montreal, Nov. 25, which diverts much traffic to Boston. The Cunard line will transfer its Montreal to London service to Boston with the sailing of the steamer VENNONIA on Dec. 2, and will continue a fortnightly service throughout the winter.

Exports to Mediterranean countries have shown a marked increase due to relief work and other factors resulting from the Near East situation. C. H. Sprague & Co. have had three sailings to Constantinople and Black sea ports during the last month in place of two sailings a month as heretofore. Coal shipments have greatly increased Boston's coastwise trade, and a condition approaching congestion has existed at many docks recently.

Lines between Boston and the Pacific coast all have had full cargoes and the trade is flourishing. The Crowell & Thurlow Steamship Co. has arranged for the purchase of two more 10,000-ton vessels to engage in this service.

Trade with European ports out of Boston is without feature, but traffic has held its own during the last few weeks. The United American Lines announce a service from Boston direct to Hamburg starting with the steamer AMASSIA. Marine interests at New England ports are confident of favorable rate decision as a result of the recent rate hearing in Boston. Other hearings are scheduled for Philadelphia and Baltimore, after which a decision will be reached.

Oakland Terminal Opened

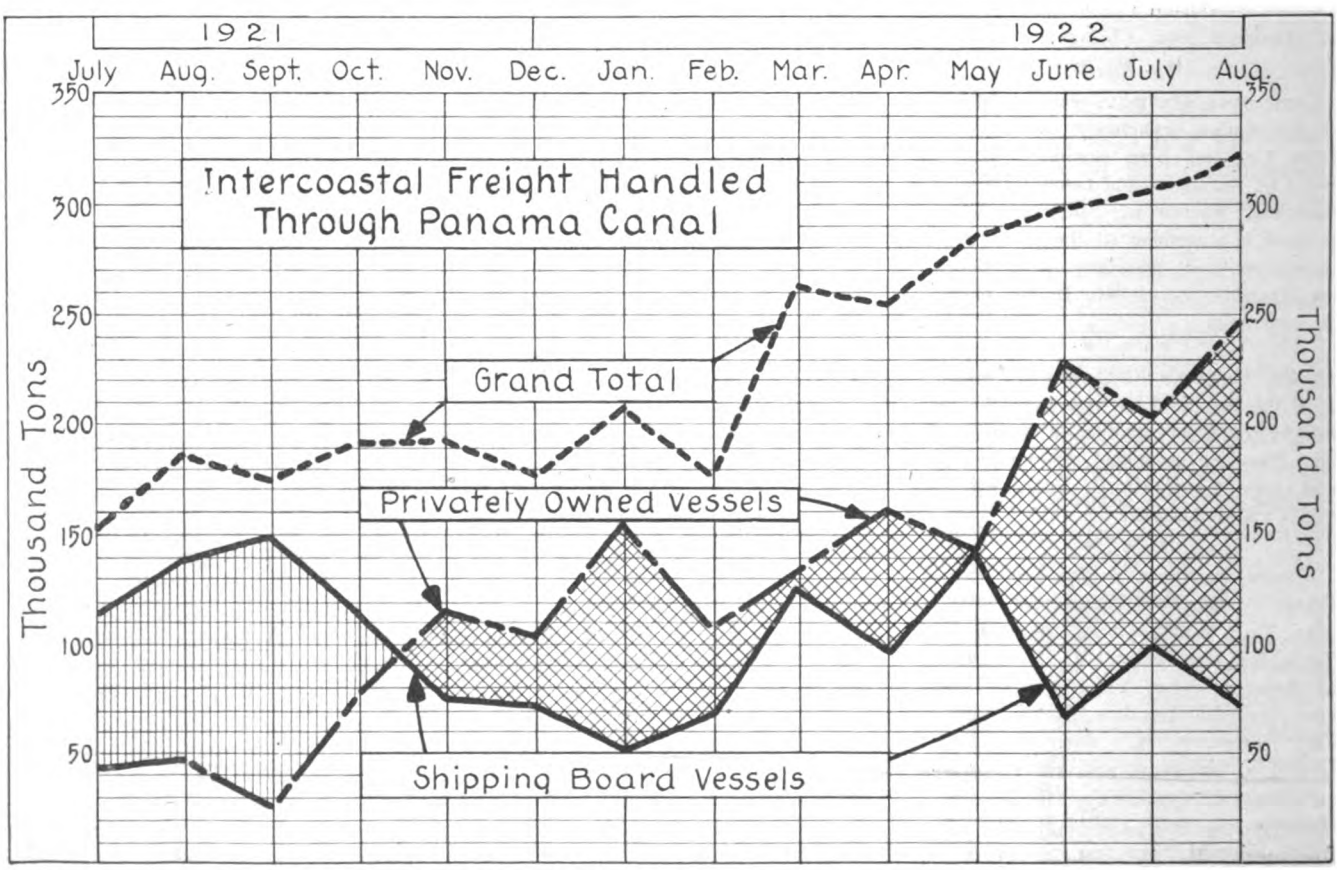
Following completion of dredging of the channel of the inner harbor at Oakland, Cal., to a depth of 26 feet at low tide, with 31 feet at the docks, the Parr Terminal at Oakland has been opened to deep sea shipping. There is 4000 feet of wharfage at this terminal and 40,000 tons of freight passed over it recently in one month.

Will Sell Large Vessels

Special effort is being made by the shipping board to interest American steamship companies in the purchase of FARALON, WEST CHOPEKA and WEST PROSPECT, four cargo vessels of the 10,000 deadweight-ton flush deck type, built by the Los Angeles Shipbuilding & Drydock Co. They are now on the market for sale. Emphasis has been placed on the fact that the ships should be unusually attractive for general cargo service on long voyages. They are equipped with reciprocating engines 3500 indicated horsepower, Scotch boilers, oil burners with a maximum speed of 12 knots and have cargo handling gear of the highest type, consisting of 22 5-ton booms, one 30-ton boom and 22 winches.

Private Vessels Meet Intercoastal Needs

Private operators under the American flag have shown their ability to meet the heavy demands of intercoastal trade. The accompanying chart covering both privately owned and shipping board vessels in intercoastal trade through the Panama canal reveals the steady growth in strength of the private operators. A year ago shipping board vessels in that trade had from a 3 to 1 to a 5 to 1 superiority over the privately owned ships. Last November, the private vessels exceeded the government ships for the first time and have maintained that leadership since. During June they had a 3½ to 1 advantage over the government ships, in July a 3 to 1 superiority and in August 3½ to 1. The chart reflects also the attitude of the present shipping board in withdrawing many of its vessels from the overcrowded trade routes.



HOW PRIVATELY OWNED AND GOVERNMENT-OWNED AMERICAN SHIPS HAVE DIVIDED PANAMA TRADE IN PAST YEAR

Marine Business Statistics Condensed

Record of Traffic at Principal American Ports for Past Year

New York

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
October, 1922...	452	1,846,327	467	1,848,637
September	519	1,985,981	542	2,104,884
August	515	1,772,837	508	1,865,798
July	509	1,928,541	520	1,977,690
June	486	1,718,879	551	2,070,048
May	524	1,769,601	496	1,759,780
April	454	1,651,584	473	1,758,160
March	462	1,708,727	484	1,829,016
February	414	1,548,412	391	1,533,163
January	370	1,230,000	396	1,436,614
December, 1921.	398	1,372,663	436	1,604,960
November	423	1,543,430	415	1,506,071
October	413	1,662,564	428	1,644,729

Philadelphia

(Including Chester, Wilmington and the whole Philadelphia port district)
(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
October, 1922...	80	205,137	73	202,326
September	103	261,963	74	224,079
August	104	273,123	76	222,478
July	116	307,058	84	248,337
June	103	282,251	83	233,964
May	117	310,117	80	234,220
April	94	245,785	63	197,807
March	107	288,295	79	257,149
February	94	240,663	6.	189,140
January	86	243,546	67	211,468
December, 1921..	89	256,660	90	285,894
November	89	249,873	87	252,606
October	86	239,103	67	204,652

Norfolk and Newport News

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
October, 1922...	17	44,423	46	149,670
September	5	22,051	45	132,751
August	15	43,887	51	158,879
July	22	62,986	55	158,254
June	22	73,791	56	175,961
May	21	61,513	73	193,599
April	18	59,180	83	232,485
March	29	77,775	79	235,809
February	24	66,156	72	192,640
January	22	78,412	53	152,957
December, 1921.	24	83,609	64	184,012
November	27	84,214	60	171,235
October	23	68,037	59	151,849

San Francisco

(Inclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
October, 1922...	556	1,125,214	526	1,109,815
September	535	1,030,252	530	1,032,879
August	507	1,071,981	506	1,038,402
July	499	1,021,517	478	1,000,501
June	483	914,717	486	873,946
May	477	885,753	470	862,712
April	419	796,654	465	895,918
March	418	816,268	446	819,813
February	409	744,590	390	729,773
January	415	797,676	416	759,577
December, 1921	439	845,793	461	854,595
November	432	791,219	445	869,988
October	445	780,840	454	787,144

Baltimore

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
October, 1922...	97	289,239	101	304,431
September	107	333,387	112	298,444
August	110	326,163	106	300,080
July	103	320,104	90	280,394
June	99	280,002	118	333,877
May	117	350,494	103	282,285
April	98	277,582	110	319,103
March	107	323,515	125	362,451
February	93	294,309	103	334,507
January	72	225,800	85	274,080
December, 1921.	95	281,373	102	312,528
November	78	243,934	80	253,943
October	73	249,481	78	252,098

Seattle

(Inclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
October, 1922...	164	417,901	148	406,498
September	159	375,340	159	382,079
August	162	396,363	153	387,908
July	140	373,211	137	371,526
June	139	384,290	137	354,702
May	138	357,583	150	361,835
April	129	328,172	154	365,057
March	198	508,760	202	515,606
February	159	478,849	147	417,425
January	174	479,514	177	509,508
December, 1921.	183	528,191	180	517,996
November	177	489,119	166	454,118
October	163	431,637	157	443,447

New Orleans

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
October, 1922...	239	630,306	235	625,605
September	212	555,017	223	571,299
August	249	625,819	250	629,150
July	227	570,709	236	601,740
June	253	596,752	234	587,483
May	236	632,495	230	610,916
April	221	565,559	225	594,842
March	235	643,251	258	716,568
February	197	582,189	201	576,973
January	225	621,483	217	603,995
December, 1921.	208	576,354	271	788,172
November	209	533,483	219	600,086
October	177	431,976	176	425,186

Boston

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
October, 1922...	149	408,855	91	217,899
September	193	511,027	101	248,328
August	192	449,871	116	203,774
July	159	324,795	94	229,492
June	137	169,015	94	161,888
May	133	251,304	104	192,231
April	71	138,683	103	270,499
March	85	241,289	56	135,671
February	76	218,853	58	153,350
January	70	185,175	42	108,423
December, 1921.	94	239,170	61	134,039
November	52	137,585	80	180,940
October	99	229,800	67	158,695

Mobile

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
October, 1922...	59	143,207	52	110,398
September	66	121,037	51	85,801
August	60	112,431	65	137,552
July	79	152,475	73	138,543
June	77	153,357	76	141,413
May	61	109,793	55	114,691
April	61	144,237	62	123,238
March	73	136,937	57	110,363
February	54	122,606	59	117,172
January	71	147,806	64	136,242
December, 1921	85	194,757	87	216,233
November	87	104,489	47	86,559
October	64	124,089	60	122,949

Los Angeles

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
September, 1922	61	127,969	96	133,561
August	52	143,931	43	117,758
July	44	125,139	48	138,275
June	48	109,261	38	90,915
May	47	141,219	55	174,644
April	53	161,709	45	138,927
March	75	172,471	59	139,424
February	76	105,243	63	108,207
January	88	149,622	101	125,795
December, 1921.	94	161,393	81	137,450
November	66	42,054	90	69,275
October	68	124,682	76	123,276
September	54	128,611	45	119,275

Key West

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
October, 1922..	61	67,755	64	77,225
September	57	64,645	59	62,676
August	65	69,962	61	65,883
July	67	80,673	67	85,336
June	60	73,308	58	73,842
May	89	107,629	82	101,318
April	77	81,917	81	86,471
March	97	78,984	92	76,531
February	84	67,080	78	68,137
January	77	69,850	77	72,321
December, 1921.	76	73,276	74	70,169
November	70	79,586	67	78,618
October	55	66,400	59	67,608

Portland, Me.

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
October, 1922..	27	60,114	22	49,594
September	32	68,125	27	57,609
August	28	42,746	28	47,459
July	19	39,950	20	39,571
June	11	16,601	15	21,765
May	16	21,380	10	22,477
April	14	51,228	18	62,091
March	23	81,938	20	77,044
February	23	73,634	24	75,625
January	21	64,885	21	67,309
December, 1921.	29	92,777	32	99,527
November	24	37,712	12	16,794
October	13	21,191	8	13,652

Savannah

(Exclusive of Domestic)

Month	—Entrances— No. Ships	Net Tonnage	—Clearances— No. Ships	Net Tonnage
October, 1922..	19	52,065	19	46,054
September	26	68,878	26	73,540
August	22	63,662	22	59,974
July	23	66,833	23	61,655
June	11	24,370	20	53,367
May	11	20,536	16	40,181
April	8	20,485	15	42,591
March	6	12,845	19	47,946
February	9	17,568	15	40,622
January	6	11,561	9	23,601
December, 1921.	4	8,876	14	43,281
November	10	19,543	16	44,187
October	6	10,417	13	37,447

Galveston

(Exclusive of Domestic)

Month	—Entrances— No. Ships	Net Tonnage	—Clearances— No. Ships	Net Tonnage
October, 1922..	59	156,587	85	260,702
September	48	144,403	56	187,724
August	59	180,814	63	203,194
July	52	165,276	59	186,201
June	61	193,016	61	200,957
May	60	196,575	57	200,787
April	64	190,675	63	210,853
March	66	155,728	55	166,298
February	45	134,229	48	138,482
January	53	141,172	65	182,442
December, 1921	74	220,988	85	235,851
November	77	221,217	70	199,885
October	72	219,001	77	227,982

Portland, Oreg.

(Exclusive of Domestic)

Month	—Entrances— No. Ships	Net Tonnage	—Clearances— No. Ships	Net Tonnage
October, 1922..	109	290,048	109	267,006
September	111	313,168	108	298,452
August	102	256,671	103	259,170
July	95	254,553	88	233,744
June	104	300,517	110	319,637
May	85	226,853	88	230,176
April	89	245,702	90	244,402
March	99	264,306	105	283,361
February	85	232,786	82	220,175
January	85	230,682	90	244,363
December, 1921.	92	266,763	94	279,862
November	89	263,595	92	273,424
October	100	302,941	97	292,067

Marine Business Statistics Condensed

Port Traffic Record

Houston

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
October, 1922.....	55	57,106	53	168,254
September	43	46,600	43	97,005
August	35	40,503	32	63,281
July	29	30,909	32	73,299
June	38	48,938	36	74,798
May	44	45,108	42	134,046
April	42	61,751	47	98,825
March	48	45,312	40	105,309
February	28	27,173	30	86,028
January	32	53,779	31	92,096
December, 1921...	22	42,359	21	27,001
November	23	30,705	27	46,519
October	17	36,682	16	32,223

Port Arthur, Tex.

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
October, 1922..	68	227,039	66	217,502
September	53	158,181	57	168,681
August	69	227,941	70	224,654
July	88	296,956	82	270,263
June	81	271,752	87	285,633
May	90	303,623	88	292,595
April	90	282,288	101	313,829
March	91	318,679	87	269,369
February	73	233,148	81	250,138
January	82	261,429	77	261,604
December, 1921.	106	359,401	104	339,605
November	92	286,179	89	263,940
October	93	256,932	89	263,993

Providence

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
October, 1922..	9	31,293	9	31,232
September	30	84,037	13	40,223
August	18	61,741	11	38,649
July	10	19,279	7	22,228
June	10	31,095	7	17,423
May	14	49,985	13	37,000
April	9	24,854	7	31,049
March	12	45,966	8	34,272
February	13	53,367	11	46,372
January	11	46,093	12	50,449
December, 1921.	8	26,053	16	50,847
November	12	50,551	16	59,677
October	13	46,530	10	44,661

Pittsburgh Freight Gains

Nearly 1,000,000 more tons of freight was hauled on the three rivers in the Pittsburgh district in October than in September, according to the report of the United States engineer. The total was 3,059,824 tons as against 2,164,830 tons. The increase was due almost entirely to the gain in coal, coke and steel shipments. The tonnages by product and river for October follow:

Commodity	Allegheny	Monongahela	Ohio	Total
Coal	142,085	1,801,549	379,675	2,323,309
Coke	....	25,308	....	25,308
Gasoline	600	570	....	1,170
Gravel	101,640	116,860	94,606	313,106
Iron and steel	4,420	19,380	24,726	48,526
Packet cargo	....	.....	5,567	5,567
Sand	110,750	131,257	93,741	335,748
Unclassified..	150	3,515	3,425	7,100
Total	359,645	2,098,439	601,740	3,059,824

Lake Michigan Receipts

Ore receipts at Lake Michigan ports in October amounted to 1,231,180 tons as compared with 1,499,762 tons in September. Individual port records are shown in the following table:

Port	Gross tons
South Chicago, Ill.....	608,038
East Jordan, Mich.....	.....
Boyne City, Mich.....	1,760
Milwaukee	5,514
Indiana Harbor, Ind.....	172,243
Gary, Ind.	443,625
Total	1,231,180

Soo Canal Report

Traffic through the Soo canal in October continued the gain begun some time ago when it totaled 11,232,668 tons as compared with 10,986,056 tons in September. This movement compares with 6,652,395 tons in October last year and is the fourth largest tonnage moved in any October of the past seven years. October figures for each year from 1916 to date are as follows:

	Net tons
October, 1922.....	11,232,668
October, 1921.....	6,652,395
October, 1920.....	13,000,299
October, 1919.....	9,713,319
October, 1918.....	13,363,287
October, 1917.....	12,646,066
October, 1916.....	9,116,196

The American canal carried all but 222,545 tons of the 11,232,668 reported for October this year. The small tonnage was shipped through the Canadian canal. For the year to Nov. 1 the Soo canal recorded 54,761,539 tons, as against 43,962,595 tons in the same period last year. Details for the seasons of 1922 and 1921 to Nov. 1 are as follows:

	To Nov. 1, 1922	To Nov. 1, 1921
EASTBOUND		
Lumber, M. ft. B. M...	197,396	191,424
Flour, barrels	7,281,143	7,805,935
Wheat, bushels	167,461,742	119,588,599
Grain, bushels	90,444,827	75,848,363
Copper, net tons.....	49,659	19,188
Iron ore, net tons.....	38,487,360	22,202,201
Pig iron, net tons.....	13,938	526
Stone, net tons.....	27,625	23,810
Gen'l merchandise, net tons	278,639	71,724
Passengers, number	29,327	32,834
WESTBOUND		
Coal, soft, net tons.....	5,959,785	11,979,596
Coal, hard, net tons.....	291,701	2,066,226
Iron ore, net tons.....	69,104	.....
Mfg. iron and steel, net tons	38,882	30,170
Salt, net tons.....	63,805	53,715
Oil, net tons.....	179,720	295,946
Stone, net tons.....	542,289	461,537
Gen'l merchandise, net tons	492,394	419,818
Passengers, number	29,483	33,399
SUMMARY		
Vessel passages, number.	14,914	11,286
Registered tonnage, net..	45,137,300	28,841,700
Freight:		
Eastbound, net tons.....	47,123,859	28,655,587
Westbound, net tons....	7,637,680	15,307,008
Total freight, net tons...	54,761,539	43,962,595

Record of Traffic Through Panama Canal

		Atlantic to Pacific traffic —Panama Canal— No. of ships	net tonnage	Tons of cargo	Pacific to Atlantic traffic —Panama Canal— No. of ships	net tonnage	Tons of cargo	Total traffic through canal —Panama Canal— No. of ships	net tonnage	Tons of cargo
1922										
September	American	54	260,249	226,741	53	235,008	315,898	107	495,257	542,639
	Foreign	72	322,167	241,095	61	252,986	354,454	133	575,153	595,549
	Total	126	582,416	467,836	114	487,994	670,352	240	1,070,410	1,138,188
August	American	58	261,613	257,674	48	236,669	305,838	106	498,282	563,512
	Foreign	83	350,249	299,087	68	235,602	303,351	151	585,851	602,438
	Total	141	611,862	556,761	116	472,271	609,189	257	1,084,133	1,165,950
July	American	52	250,378	246,471	55	272,868	335,154	107	523,246	581,625
	Foreign	76	323,853	295,941	68	280,772	333,534	144	604,625	629,475
	Total	128	574,231	542,412	123	553,640	668,688	251	1,127,871	1,211,100
June	American	57	256,060	269,098	45	205,063	211,373	102	461,123	480,466
	Foreign	78	338,136	317,284	48	171,454	179,728	126	509,590	497,012
	Total	135	594,196	586,377	93	376,517	391,101	228	970,713	977,478
May	American	59	285,265	343,913	49	226,356	264,626	108	511,621	608,539
	Foreign	75	309,448	329,485	60	211,747	220,483	135	521,195	549,968
	Total	134	594,713	673,398	109	438,103	485,109	243	1,032,816	1,158,567
April	American	47	220,055	260,442	48	223,913	238,420	95	443,968	498,462
	Foreign	74	300,633	301,991	61	230,232	245,194	135	530,865	547,585
	Total	121	520,688	562,433	109	454,145	483,614	230	974,833	1,046,047
March	American	57	256,613	239,696	46	215,547	219,569	103	472,160	459,265
	Foreign	81	329,428	342,256	50	174,223	158,568	131	503,651	500,824
	Total	138	586,041	581,952	96	389,770	378,137	234	975,811	960,089
February	American	46	199,564	186,486	42	192,931	193,643	88	392,495	380,129
	Foreign	68	288,441	256,339	56	205,599	201,606	124	494,040	457,945
	Total	114	488,005	442,825	98	398,530	395,249	212	886,535	838,074
January	American	47	208,770	206,633	38	169,575	153,649	85	378,345	360,282
	Foreign	78	304,994	286,958	47	163,177	160,058	125	468,171	447,016
	Total	125	513,764	493,591	85	332,752	313,707	210	846,516	807,298
1921										
December	American	44	198,506	163,744	43	198,528	179,441	87	397,034	343,185
	Foreign	91	377,163	353,366	61	243,047	256,502	152	620,210	609,868
	Total	135	575,669	517,110	104	441,575	435,943	239	1,017,244	953,053
November	American	48	227,644	173,027	36	160,457	182,992	84	388,101	356,019
	Foreign	75	311,373	213,654	63	242,937	285,767	138	554,310	499,421
	Total	123	539,017	386,681	99	403,394	468,759	222	942,411	855,440
October	American	43	201,893	165,942	46	195,968	217,141	89	397,861	383,083
	Foreign	88	369,282	208,495	78	302,411	394,197	166	671,693	602,692
	Total	131	571,175	374,437	124	498,379	611,338	255	1,069,554	985,775
September	American	46	210,031	161,875	41	200,375	222,226	87	410,406	384,101
	Foreign	82	320,603	138,845	52	194,128	231,948	134	514,731	370,793
	Total	128	530,634	300,720	93	394,503	454,174	221	925,137	754,894

October Ore Shipments

October shipments of iron ore from upper lake ports were about double those of the corresponding month last year. Last month's total of 6,081,386 gross tons brought the season's record up to 39,192,624 gross tons and assured a 1922 movement of about 42,000,000 tons. The shipments for the month and season follow:

Port	October 1922	To Nov. 1, 1922
Escanaba	795,801	4,121,426
Marquette	231,661	1,857,564
Ashland	800,494	5,442,839
Superior	1,793,270	10,277,983
Duluth	1,730,870	11,914,348
Two Harbors	729,290	5,578,464
Total	6,081,386	39,192,624
1922 increase	2,848,305	17,298,349

Lake Erie Ore Receipts

Receipts of iron ore at Lake Erie ports in October declined slightly from September, totaling 4,764,588 tons as against 5,456,476 tons in the month before, according to compilation by MARINE REVIEW. The balance on dock Nov. 1 was 9,586,234 tons as against 9,672,077 tons at this time last year and 9,028,708 tons Oct. 1. Receipts by individual Lake Erie ports in October were as follows:

Port	Gross tons
Buffalo and Port Colborne	498,599
Erie	90,850
Conneaut	1,042,827
Ashtabula	1,140,843
Fairport	81,243
Cleveland	1,015,367
Lorain	451,527
Huron	113,711
Toledo	186,078
Detroit	143,543
Total	4,764,588

Late Flashes On Marine Disasters

Brief Summaries of Recent Maritime Casualties— A Record of Collisions, Wrecks, Fires and Losses

NAME OF VESSEL	DATE	NATURE	PLACE	DAMAGE RESULTING
Arcturus	Oct. 3	Coll., sank	Detroit River	Considerable
A. T. Kinney	Oct. 12	Gale, grd'd.	Hay Lake	Not stated
Algiers	Oct. 24	Disabled	Key West	Leak. badly
Ada Tower	Oct. 25	Disabled	Barbadoes	Sails and rig. dam.
Barge No. 176	Oct. 20	Fire	Tremley Point	Not stated
Burpee L. Tucker	Oct. 6	Struck obst.	Parrsboro, N. S.	Leaking
Bethlehem	Oct. 30	Disabled	Port Aux Basques	Rudder dam
Bronson	Nov. 7	Stranded	Lachine Lake	Not stated
Beckenham	Oct. 31	Gale	Sydney	Dragged anchor
Cepheus	Oct. 15	Fog, grd.	Grosse Point	Not stated
C. S. Robinson	Oct. 22	Fog, grd.	Devil Island	24 plates damaged
Cape Cod	Oct. 20	Collision	Thames River	To upper works
Charles A. Dean	Oct. 25	Fouled	Off Clifton	Undam.
Canadian Seigneur	Nov. 1	Disabled	At sea	Stern post & rudder gone
Colonel	Nov. 6	Fog, grd.	On Waverley shoal	Not stated
Charles F. Gordon	Oct. 31	Grounded	Halifax	Undam.
Dicto	Oct. 19	Disabled	Cork	Peaks l eak.
Dream	Oct. 20	Not stated	St. John River	Sank
Dorothy Palmer	Oct. 28	Disabled	Off Nantucket	Lost rudder
Duchess	Oct. 26	Collision	Erie Basin, N. Y.	Slight
Dorothy	Oct. 26	Collision	St. John, N. B.	Bowsprit, jib & headgear gone
Dauperata	Oct. 28	Disabled	Lizard	Steerer dis.
Eagleboat	Oct. 16	Wrecked	Off Cuttyhunk	Considerable
Elkhorn	Oct. 28	Disabled	New York	Prop. blade lost
Empress	Oct. 10	Disabled	Victoria	Engines dis.
Edmonton	Nov. 8	Stranded	Lake Brancis	Not stated
Evelyn V. Miller	Oct. 30	Grounded	Yarmouth	May be total loss
Friendship	Oct. 18	Gale, leak	N. of Point Aux Barques	Adrift
Firmore	Oct. 28	Disabled	At sea	Machy. dis.
Governor	Oct. 25	Grounded	NE of Ellis Island	Not stated
Golden Shore	Oct. 22	Fire	Off Butchertown	Not stated
General Petitti	Oct. 27	Disabled	Jacksonville	Prop. broke
Huron	Oct. 11	Grounded	Detroit River	Jettis. cargo
Helen C.	Oct. 17	On bottom	Off Alpena	May be total loss
Hugo Stinnes	Oct. 15	Collision	Houston Ship Channel	Slight
Hawaiian	Oct. 25	Fire	Philadelphia	Undam.
Homestead	Oct. 26	Disabled	SE of Highlands	Not stated
Hope Sherwood	Oct. 2	Disabled	Off Cape Hatteras	Rud'r gone
Howard Sisters	Oct. 30	Ashore	Off Sandwich	Sank
Hauger	Oct. 26	Disabled	Port Alfred	Mach. trble.
Hampstead Heath	Oct. 30	Disabled	Rotterdam	Steerer dis.
Harrison T. Beacham	Oct. 2	Gale	At sea	Lost part of deckload
Helen Jean	Oct. 28	Not stated	Turks Island	Tota lloss
I. D. Fletcher	Oct .24	Ashore	Handkerc'f Shoal	Oil pumped out of tanks
Innoko	Oct. 20	Was in col.	Antwerp	Dam. above water line
Julia Luckenbach	Oct. 21	Grounded	Pier 7 Communipaw	Not stated
Jalapa	Oct. 25	Fouled	Off Clifton	Undam.
Kiowa	Oct. 25	Gale	Caribou Island	Water in oi fuel
Krosfond	Oct. 26	Collision	St. John, N. B.	Not stated
Linden	Oct. 18	Grounded	Near Bellmouth	Not stated
Louis H. Smith	Oct. 21	In tow	Off Lunenburg	Sails gone
Lenape	Oct. 17	Grounded	Near Nassau Inlet	Not stated
Lyman Stewart	Oct. 8	Collision	Presidio, San Fran.	Total loss
L. J. Drake	Nov. 1	Disabled	New York	Steerer dis.
Modica	Oct. 17	Grounded	Montreal	Jettis. caro
Maud	Oct. 25	Not stated	S. W. of St. Clair Canal	On bottom, wreck
Mongibello	Oct. 25	Ashore	Anticosti Islands	Leaking
Mecosta	Oct. 29	Foundered	Off Cleveland	Abandoned
Marie de Ronde	Oct. 25	Disabled	Vineyard Haven	Lost mast & sail, leak
M. J. Taylor	Oct. 4	Hurricane	Near Virgin Islands	Consider'e
Madeline Constance	Sept. 24	Storm	Mid-ocean	Sank
Marshal Foch	Oct. 11	Ashore	Sable Island	Not stated
Maple Court	Nov. 7	In tow	Lachine Lake	Grounded
Mariposa	Nov. 5	Grounded	Green Bay	To No. 3 compart
Mdig	Nov. 4	Struck object	Off Esbjerg	Lost prop.
Norman Bridge	Oct. 15	Collision	Houston Ship Channel	Slight
Norefjord	Nov. 1	Fire	Christiania	Slight to cargo
President	Oct. 24	Fire	Philadelphia	Slight
Port Reath	Oct. 25	Collision	Bristol Channel	Not stated
Port of Portland	Oct. 14	Collision	Willamette River	Sank
Plover	Oct. 31	Grounded	New York	Not stated
Peter Howard	Oct. 30	Ashore	Off Sandwich	Gone to pieces
Quaker City	Oct. 1	Struck on rocks	Aberdeenshire, Scotland	Heavy
Ruth & Margaret	Oct. 18	Heavy gale	At sea	Masts & bow sprit gone
Red Feather	Oct. 20	Collision	Thames River	Cut in two
Remus	Oct. 25	Collision	Bristol Channel	Not stated
R. R. Richardson	Nov. 6	Fog, ashore	Below Decatur	Leaking
S. J. Murphy	Oct. 21	Disabled	Lake Superior	Stripped buckets off wheel
Saskatoon	Oct. 21	Crashed into lock	Lachine Canal	Not stated
Strathcona	Oct. 4	Storm	Off Cabot Island	Sank
Swift Star	Oct. 10	Grounded	Block Island, R. I.	Considerable
Seaman, A. O.	Oct. 18	Grounded	Off Cuttyhunk	Heavy
Santa Clara	Oct. 14	Collision	Willamette River	Not stated
Santiago	.....	Grounded	E. of Sagua	Jettis. cargo
Tom Beattie	Oct. 19	Gale	Off Portland	To steerer & sail, leak.
Thomas Flannery	Oct. 26	Collision	Erie Basin, N. Y.	Slight
Teti	Oct. 31	Not stated	S. of St. Michaels	Foundered
W. D. Mathews	Oct. 9	Ashore	Cove Island	Heavy
W. D. Crawford	Oct. 15	Fog, grd.	Below Algonac	Jettis. cargo
West Gotomska	Oct. 21	Fire	Brooklyn	Slight
Winnipeg	Oct. 21	Hit bottom	Lachine Canal	Considerable
Walter A. Luckenbach	Oct. 8	Collision	Presidio, San Francisco	Crippled

Equipment Used Afloat, Ashore

Install Oil Burners—Automatic Tank Vent Valves—Removes Oil from Bilge and Ballast Discharge—Hydroelectric Steering Gear—Economy in Use of Paint—Mechanical Steering Device

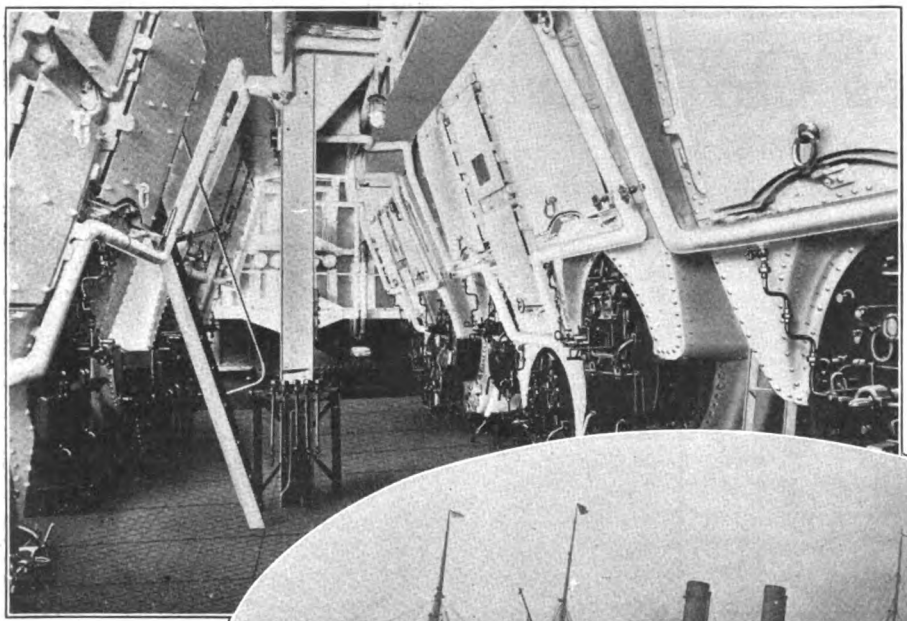
CONTRACTS for the installation of mechanical fuel oil burners in twelve passenger and freight vessels have recently been awarded to the Todd Shipyards Corp. These vessels, totaling 78,100 indicated horsepower, are the EMPRESS OF SCOTLAND of the Canadian Pacific Co. shown in the accompanying picture, the CALAMARES, PASTORES, LIMEN, ESPARTA and SAN JOSE of the United Fruit Co., the EL CID, EL SIGLO, EL DIA and EL RIO of the Southern Pacific Co., the CITY OF JACKSONVILLE of the Mallory line. The Mallory liner SAN JACINTO is equipped, the recent installations being shown in the accompanying pictures.

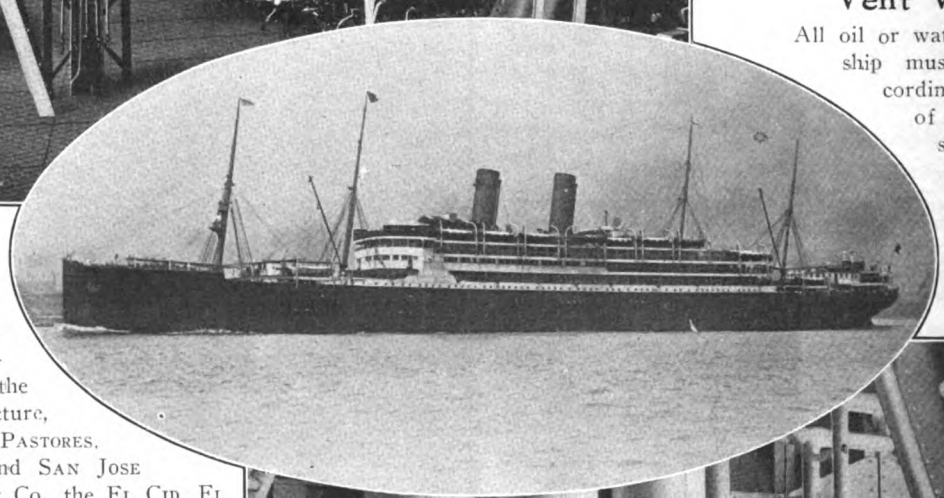
The Red Star liner KROONLAND is being fitted with Todd burners in place of an older type installed some time ago. The Todd corporation has equipped nearly two thousand vessels with its burners.

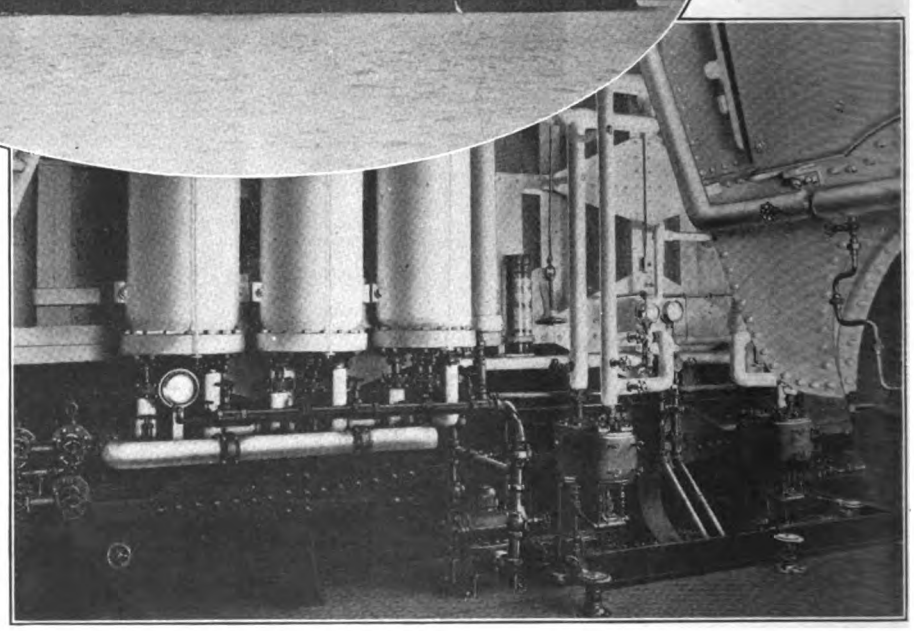
The work on the five fruit steamers, the EL SIGLO, EL CID and the KROONLAND, is being carried out at the plant of the Robins Dry Dock & Repair Co., Brooklyn, while the EL DIA, EL RIO and the CITY OF JACKSONVILLE are being converted at the plant of the Tietjen & Lang Dry Dock Co., Hoboken, N. J.

The EMPRESS OF SCOTLAND will be fitted with the burners on her next arrival at an English port by Todd Oil Burners, Ltd., London. She was formerly the Hamburg-American liner KAISERIN AUGUSTE VICTORIA of 24,581 gross tons. There are 51 furnaces in this vessel and the decision of her owners to replace her oil burners with Todd equipment followed the performance of the Canadian Pacific liner MONTCLARE which burns oil under the Todd system. The MONTCLARE was equipped by Todd Oil Burners, Ltd., before she left the yards of her builders, the John Brown Co., Clydebank.

Contract for reconditioning the Texas Co.'s steel tank steamship LOUISIANA also has been placed with the Todd corporation. In addition to the reconditioning work, Todd mechanical fuel oil burners and necessary auxiliary equipment will be installed. The LOUISIANA is now at the plant of the Robins Dry Dock & Repair Co., where the work will be carried out.







CONVERSION OF COAL BURNING VESSELS TO USE OF OIL CONTINUES ACTIVELY. THE ILLUSTRATIONS SHOW RECENT INSTALLATION OF TODD SHIPYARDS CORP. EQUIPMENT. CANADIAN PACIFIC EMPRESS OF SCOTLAND (CENTER) IS BEING CONVERTED IN ENGLAND. THE OTHER VIEWS SHOW ENGINE ROOM OF THE MALLORY LINER SAN JACINTO AFTER CONVERSION

Designs Automatic Tank Vent Valve

All oil or water tanks on board ship must be vented according to requirements of the classification societies. For merchant ships, the general method of venting is to carry the proper size and num-

ber of vent pipes from the tank, whether double bottom, side or deed tank, through the upper or weather deck and extending above this deck, ending in a return bend, the free end of which is covered with wire mesh.

The matter of venting, especially in the case of oil tanks, is of such vital importance that relief valves have not been adopted due to lack of absolute confidence in their positive operation under practical conditions of service. Seams might readily be opened up in inner bottoms or bulkheads of tanks if vents did not work properly; difficulty in discharging might also be experienced. An automatic tank vent valve would be generally adopted, provided it was positive in operation under all conditions of service. Such a valve must be carefully made and must receive reasonable inspection and care after installation on board ship.

A valve exhibited at the marine show by the William Cramp & Son's Ship & Engine Building Co., Philadelphia, and developed by J. C. P. deKrafft of the Tank Vent Valve Co., 1340 Pine street, Philadelphia, is interesting as a type of automatic vent valve, designed to meet these service conditions. The following description and accompanying illustrations explain the operation:

Two separate valve disks seat on separate seats, instead of one disk seating upon the other disk. Both of the disks open upward and close downward, by gravity, instead of one disk opening downward, and being held in its place by a spring. This design was followed to avoid any danger of this disk falling open through an accident to its spring.

The pressure at which it is desired to have the disks operate may be controlled by springs or by means of weights, which are a constant force. The wire net screen around the bottom not only prevents dirt from entering the valve, but also acts as a protection against fire. This screen also acts as an indicator to show whether the valve and vent pipe are open or closed.

When the tank is being filled and pressure is caused in it, the lower disk lifts and the air escapes through the ports and the screen into the air. When the tank is being emptied and a vacuum is caused in it, the air enters through the screen and the ports to the chamber over the lower disk, lifts the upper disk and flows into the tank through the passage between the ports. In case of accident such as a collision or grounding, where a tank is punctured and may fill with water, the valve may be quickly closed, completely stopping the vent pipe and preventing the escape of the air from the tank and the water from entering it. This valve is said to have passed successfully stringent tests by the United States navy and to have been approved

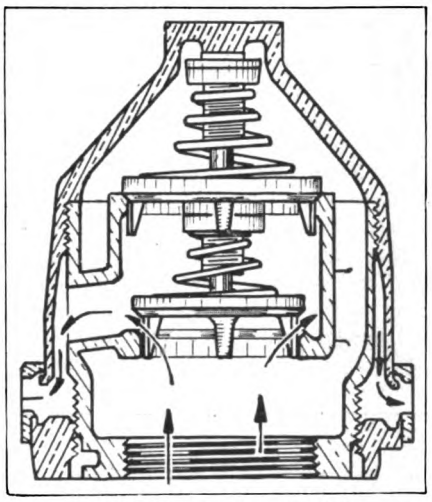


FIG. 1—LOWER DISK RAISED, AIR ESCAPING, WHEN FILLING TANK

by the American Bureau of Shipping, Lloyd's Register of Shipping and the United States Salvage association.

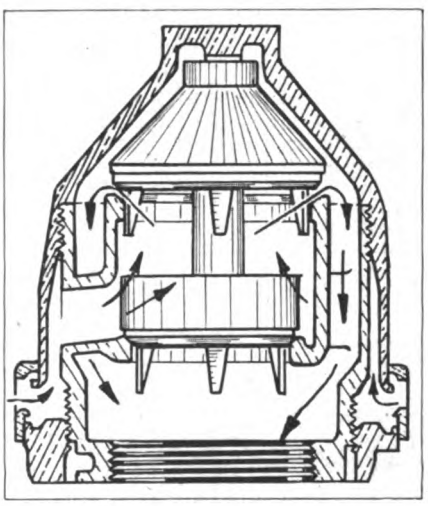


FIG. 2—UPPER DISK RAISED, AIR ENTERING, WHEN EMPTYING TANK

Among the essential advantages claimed over the open pipe vent are:

1. In case of accident to the tank, the valve may be closed quickly and the vent pipe completely stopped, preventing any escape of air through it, and the water from entering the tank.

2. Under normal conditions, both disks remain closed and thereby prevent loss of oil by evaporation, and also prevent the continuous flow of inflammable vapor from the tank. This decreases the chance of fire, and allows for the change in pressure in the tank due to the expansion and contraction, of the oil or other liquid, caused by changes in temperature.

3. The possibility of shipping water through open vents is eliminated.

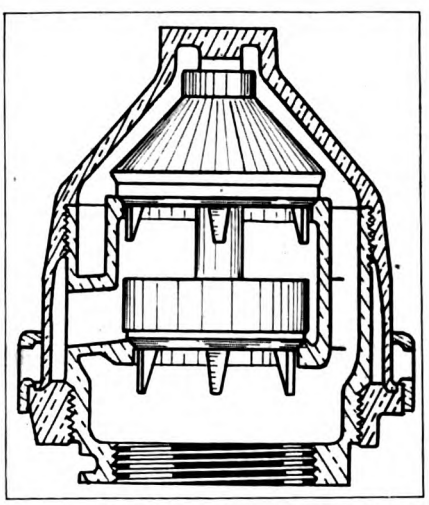


FIG. 3—BOTTOM RING SCREWED UP CLOSING VALVE IN CASE OF ACCIDENT

Removes Oil from Bilge and Ballast Discharge

Introduction of fuel oil on board ships has promoted economies in ship operation, especially through lengthening the steaming radius, saving space, facilitating bunkering, increasing flexibility in steaming and eliminating the hard labor attending the firing of a coal burner. Though fuel oil makes for a clean ship not only in boiler and engine room but throughout, certain features have been a source of trouble. One of the most important has been the pollution of waters in harbors and also at beaches up and down the entire coast lying in way of ocean trade routes. This nuisance has now come to the point where stringent laws are in force against the discharge of oil mixed bilge and ballast water within the limits of harbors. Serious consideration is being given at the present time to the problem of control of the discharge of such oil mixed water even off shore.

Oil burning ships carry their fuel in double bottoms as well as in side bunker and athwartship bunker tanks. The situation often arises, when any compartment is emptied of oil, that salt water is admitted in place in order to keep the ship deep enough or in proper trim. The result is that before fuel oil can again be taken these tanks must be emptied. Where to discharge this oil mixed water has become an increasingly difficult problem.

For this reason, particular interest attaches to a recent attempt to solve this difficulty by introducing into the bilge and ballast discharge a simple filter tank for separating the oil from the water. The water is discharged overboard clear and the salvaged oil put back into bunker space. This system of eliminating oil from bilge and ballast discharge was developed by the Todd Shipyards Corp., New York and was shown and demonstrated at the marine exposition.

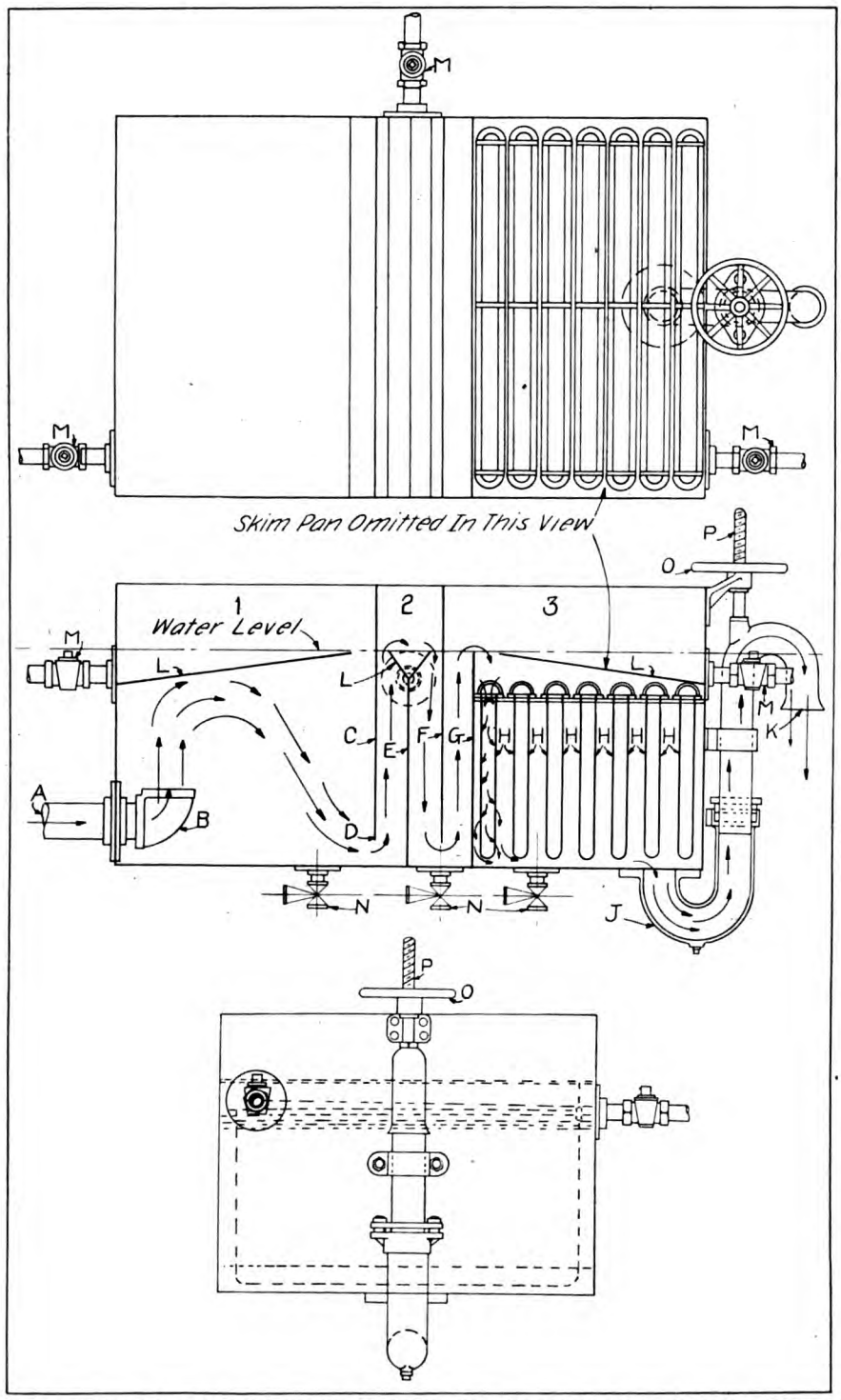
The system consists of passing the overboard discharge of bilge and ballast pump through a filter, as shown in the accompanying illustration, where oil is

removed from water by gravitation and filtration. The filter is essentially a rectangular sheet iron tank located at any convenient point above the load waterline of the vessel.

The filter construction and method of operation is simple. The rectangular tank is subdivided into three or more compartments. The overboard discharge, consisting of water and oil, from the pump enters the filter tank through pipe *A* into compartment No. 1 and is deflected upward by the elbow or bend *B*. Compartment No. 1 being relatively large acts as a reservoir and this permits the major portion of the oil contained in the discharge, sufficient time to flow to the top of the level in the compartment. The flow from compartments *1* to *2* is baffled by a division plate *C* which is open on the bottom only at *D*.

Compartment *2* is also fitted with a division plate *E* which forces the water to flow up over it and down behind a third division plate *F* which is similar to *C* and separates compartments *2* and *3*. The flow of water under and over these baffles permits the oil to rise to the top due to its lighter gravity and the final flow into compartment *3* over baffle *G* is relatively free from oil.

The water is then passed through filtering cloths *H* and these cloths entirely eliminate the final particles of oil from the water which is then carried overboard through pipe *J* and return bend *K*. Each compartment is fitted with a skimming pan *L* and drain cocks *M* by which the oil which floats to the top of the various compartments can be drained from the filter into a settling tank. Each compartment is also fitted with a clean out valve *N*. The water level throughout the unit can be varied by adjusting the height of return bend *K* by means of hand wheel *O* and shaft *P*.



PLAN, SECTION AND END VIEW OF NEW FILTER TANK FOR ELIMINATION OF OIL FROM BILGE AND BALLAST DISCHARGE

Eliminates Weakest Link in Steering System

Improvements in steering gear for ships still are being made. Broadly speaking, the steering gear of a vessel may be divided into three parts: 1, the steering engine, steam, hydraulic or electric; 2, the method of transmission from bridge to steering engine; and 3, the means of transmitting action of steering engine to quadrant or helm.

Whether steam, hydraulic or electric, the steering engine proper may be said to have been brought to great refinement. No reasonable complaint can be made on this score.

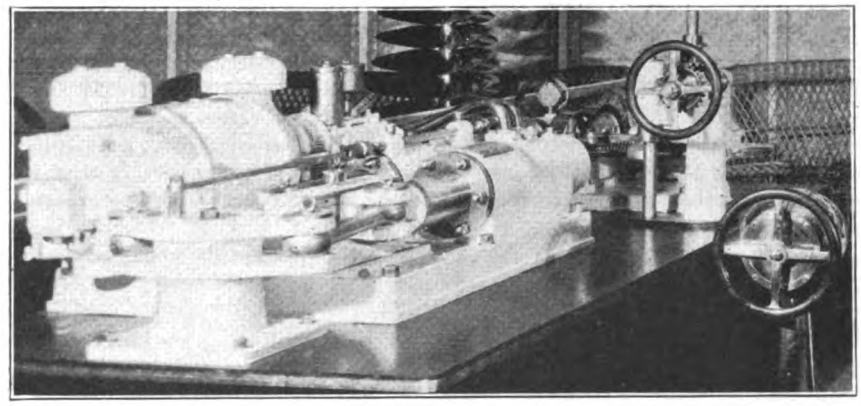
In the old reliable gear used even on some of the latest ships the entire steering system consists of the 2-cylinder horizontal steam steering engine driving drum with chain attached. This engine is located as a rule on the upper levels in the after end of the engine room. The engine is started, stopped and reversed from the bridge or pilot house by direct transmission, that is by shafting and beveled gears from bridge to steering engine valve. The action of the steering engine, in turn, is communicated to the rudder by means of a chain carried from drum of engine over fairleads to quadrant or helm on the rudder head.

The next development shows the steam steering engine in the after end of ship directly connected to the yoke or crosshead on rudder. In this case the steering engine is started, stopped and reversed by a telemotor gear operated from the distant bridge by hydraulic connection. This steam steering gear with hydraulic telemotor control works with a reasonable degree of certainty. The weakest part of this system is of course the hydraulic transmission from the wheel on the bridge to the engine in the stern of the ship.

The latest development is an electric motor driven hydraulic steering engine, located astern, started, stopped and reversed from the bridge by electric tele-

motor. An interesting example of this type was exhibited at the marine exposition by the Hyde Windlass Co., Bath, Me. The hydroelectric steering gear, shown in the illustration, is direct connected to rudder crosshead by connecting links. The cylinders and rams are located in a fore and aft direction. The pumping set for this gear consists of a variable stroke delivery pump direct-connected to a General Electric Co. marine type motor. The set runs continuously and can supply liquid under pressure from zero to 1000 pounds per square inch. The pump is fitted with an automatic pressure regulator to control the stroke of the pump and prevent overloading the motor. When the pressure runs up to a predetermined amount, the stroke of the pump is reduced to zero. The lubricating oil which is used in this system is distributed to the plungers by means of a control valve similar to that used on any steerig engine. This control valve is, in turn, operated by means of a small electric motor which is started, stopped and reversed by the electric telemotor.

The builder claims that the electric telemotor which operates motors for starting, stopping and reversing steering engine has been perfected. No contactors are used in this telemotor and it is run by three wires from the pilot house to the steering gear. The current required is about 100 watts alternating single phase 115 volts. In case alternating current is not available on board ship, a small generating set would supply the current or the addition of two collector rings to the armature of any moving motor or generator.



NEW HYDROELECTRIC TELEMOTOR STEERING GEAR

A compact steering gear, electric motor driven worm geared drum, with chain from drum to rudder quadrant was also demonstrated by the Hyde Windlass Co. This steerer has a 15 horsepower General Electric motor, self-contained on the same bed plate with steering gear. The motor is started, stopped and reversed by the new electric telemotor.

In any distantly controlled ship steering gear the method of control from the pilot house to steering engine, is without doubt the weakest link. In making this control a simple electrical transmission a decided step in advance has been made in providing an efficient, certain, positive method, with every mechanical assurance of constantly correct operation.

Paint Important Item of Ship Expense

BY CAPT. E. ARMITAGE McCANN

FOR BOTH the preservation and appearance of a ship, she must have paint and plenty of it. Paint thus forms one of the principal items of running expenses, which makes it important that both the men who are to buy and to use it should know something about it.

Anything mixed with oil will form paint of a kind, but the chemists have spent much time in research to find the best material and oils to obtain the most preservation, opacity and refraction, the combination which, with the desired color, forms the ideal paint. Opacity of pigment increases with the fineness of division of the particles, so fine grinding is most important. The more the paint refracts the light the better it covers and as the refractive index of the vehicle or oil approaches that of the pigment the opacity diminishes. Refraction is caused by the film round the particle.

Opacity increases inversely with the amount of oil absorbed by the pigment. For instance, putting 30 parts of oil to 70 of lead gives great opacity, but 50 parts of oil to 50 of the zinc gives greater durability because of the greater amount of oil but less opacity.

Best for all round painting is a mixture. White lead dries soft, goes on easily, is a good preservative and has great covering power, but is inclined to powder after a while. White zinc on the other hand dries hard and does not discolor so readily, but has not much covering power. A little silica does no harm as it has covering power and is good for keeping the pigment in suspension.

Ready mixed paints frequently have barium sulphide or barytes also, but though some recommend this, its value for ship work, where preservation is the first essential is doubtful and it should be looked upon as an adulterant, as should most of the inert fillers, such as infusorial earth, clay, whiting and the like.

Driers are another vexed question. Linseed oil dries by oxidation which is hastened by the addition of lead or manganese oxides. Only a very small proportion is permissible as used in excess it reduces the lasting and preserving qualities of the paint. Turpentine, benzine or other spirits are not driers, but only thinners and again reduce the quality of the paint mixture.

The better plan would be to have neither driers nor spirit in the mixed paint but to buy these separately and add the drier when the paint is to be used—it has more effect when freshly used—and to use spirits only when painting has to be done in unfavorable weather. Cheap paints usually have an excess of water, which is most distinctly an adulterant and harmful, as it is inclined to set up oxidation under the paint.

The trouble is that the lowest bid usually gets the order without reference to the contents of the paints. Wonder then is expressed that though the men are always painting, the ship never looks decent and rust is continually breaking through.

The suggestion is to hark to the old fashioned idea and put aboard the paints ground in oil in paste form, with the oil, driers, etc., separate and have them mixed aboard as required. This mixing would be no waste of time, as it does not take long and the surfaces do not have to be gone over so often to keep them in order. The proportion is about 100 pounds of paste paint to 4 to 6 gallons of linseed oil, with a half pint of liquid driers. The great majority of foreign ships have to mix their own paints. This may be conservative but it is

also economy of money as well as time.

If ready mixed paints are insisted upon, exact specifications should be demanded and it would be well worth while to have experiments made with different makes on one ship. A bulkhead could be painted with strips to test the color and preservative qualities in actual practice.

Red lead is commonly credited with being the best iron preservative. This undoubtedly is true in laboratory tests and the like, but it is doubtful if in actual practice its value is so high. Plates occasionally come out of a ship still showing where the number was painted on in white lead during construction, while all the rest of the plate is rusted to paper thinness. In some shipyards nothing but white lead is used on new iron. A test once was made on new plates in the bunker and on the water line outside where the conditions are severest owing to the moisture and changes of temperature. One third was painted with red lead, one third one part red and two parts white lead and one third with white lead, all mixed aboard with linseed oil and a trace of driers, and covered with a coat of bitumastic inside and boot-topping outside. The mixture of white and red stood best and white lead next and the red lead last. This demonstrated that red lead could be mixed into the white without wetting and that the latter gave body and softness to the others and airtight hardness. Unfortunately the vessel was torpedoed before the experiment could be carried to an absolute conclusion.

Should Be Thoroughly Cleaned

The great drawback to the use of red lead is that it is tricky to use and has to be just right. If water is added for smooth mixing, this causes bubbles which oxidizes the iron. It is rather like plaster of paris in action, as once it hardens, it may be remixed or reground but is useless as it has lost all its valuable properties. It is best about an hour after mixing. But aboard this is seldom considered and it is used stale, with more oil or turpentine added. It is also heavy and tiring to use and is liable to be thinned down until valueless. Mixing in graphite or silica helps to keep the lead suspended, and here is a case in which the right filler would be of value. There is now on the market a ready mixed red-lead that stops mixed and retains its virtue.

Bare iron must, of course, be thoroughly cleaned before applying any paint. For this, if the rust is light, a wire brush is invaluable with, if possible, sand or other abrasive, followed by a fiber brush Sand blasting would be ideal and should be adopted in dry docks and repair yards. Kerosene is useful for bringing rust to the surface and a good drenching with this lightens the labor of chipping and scaling; hydrochloric acid is better.

For the underwater portion a good mixture is iron oxide, zinc oxide, mercuric oxide, shellac, pine tar and turpentine. This will dry rapidly and will not peel off but will powder if exposed to the air. Mercuric oxide is considered better than mercuric chloride for the toxic. Copper oxide would be good but is electronegative to iron and will corrode it. All bottom paints must be kept thoroughly stirred.

A good boot-topping for that part of the ship which requires the most care is iron oxide, zinc oxide or lamp black ground and mixed in varnish thinned with mineral spirit and driers. One coating good for tanks, tanktops, bilges and bunkers is bitumastic paint over the red or white lead or directly on the iron and sprinkled with dry cement while is is wet.

MECHANICAL STEERER

A fine mixture for fresh water tanks is kauri gum varnish and silicate. This is transparent but that does not matter, it has good lasting qualities and is non-poisonous. It also may be sprinkled with dry cement to advantage, while wet, of course, with the loose brushed off before filling the tank. Iron to be cemented should not be previously painted.

Tinted paint wears 30 to 60 per cent better than white.

Should Be Applied Often

Graphite paint is good for the winches, especially the cylinders. It has not much covering power, but this is unimportant as the best plan here with any paint is thin coats and often, put on with a wad.

Some say that red oxide of iron is even superior to red lead as a preservative and it is undoubtedly a good paint for the inside of the holds, where color is immaterial.

Much paint is wasted through the men being allowed to put their pots in the locker without emptying them into the drum and scraping them out every time they knock off. If the pots were wiped out with the brush before putting away there would be but little skin to contend with. Skins should always be removed and thrown away.

Every good painter, of course, knows that two thin coats are better than one thick one, and that the first should be thoroughly dry before another is applied. Enamel is economical for interior work, as it washes easily and retains its surface and color. Paint is one of the things in which judicious economy should be exercised. The best is the cheapest. It should be used with care but not skimped where the welfare of the ship is concerned. A little use of just soap and water will often save a lot of paint.

Steers Ship Mechanically

Steering ships mechanically in order to provide further economical operation and to relieve wheelsmen of the physical effort required when steering by hand, has been under development since before the war when many experiments were abandoned. Since then, however, improvements have been made and among the companies putting on the market a mechanical steering device is the Sperry Gyroscope Co., Brooklyn.

The Sperry instrument, shown in the accompanying illustration, was perfected recently and is reported to have operated successfully on voyages, some of which covered 4000 miles. The letter *A* shows the repeater compass. *B* the wheel for hand setting the course and *C* the clutch for engaging the mechanical device.

Shipyards Employ More

Continued increase in activity in steel shipyards of the country is shown in the government's employment report for September in comparison with August. Reports received from 17 yards indicate 11,770 workers employed on an average weekly in September as against 11,245 workers on an average weekly in August. This is a gain of 4.7 per cent. The weekly payroll for the 17 companies in August totaled $291,455 and in September $300,033.

Activities in the Marine Field

Latest News from Ships and Shipyards

Roads Blamed for Poor Lake Season

BY MYERS L. FEISER

INABILITY of the railroads to supply sufficient cars to move the heavy grain tonnage from Buffalo elevators has proved to be the stumbling block to a successful closing of the lake trade. The trouble at Buffalo began with the railroad strike which, with the coal strike, held the shipping back at the very outset of the season. With the ending of both strikes, the railroads began to provide more cars, but late in October car loadings of all freight in the United States reached the second highest point in history while the car shortage reaches the highest mark ever attained.

The lake shipping season ends in a few days and steamers already have been laid up or are being used for storage of grain, many finding their proposed schedules of round trips sharply curtailed. Some boats at Buffalo were forced to wait nearly three weeks before their cargoes could be lifted.

Up bound the vessels have been able to take the coal offered and in several instances had to wait cargoes, due also to the shortage of cars. Ore shipments in October totaled more than 6,000,000 tons, making the aggregate for the season more than 39,000,000. It is believed the season's business will more than total the 42,000,000 tons, the figure set some time ago as the mark to shoot at.

* * *

When her fuel oil became mixed with water which came aboard during a heavy blow soon after she cleared from Fort William with grain, the steamer KIOWA was unable to proceed and was forced to anchor near Caribou island. The steamer CUYLER ADAMS went alongside, raised the KIOWA's anchor and towed her to Whitefish point where she finally got up steam and proceeded to Buffalo.

* * *

The Midland Shipbuilding Co. has bought the barge GEORGE E. HARTNELL from the Horrow Steamship Co. to convert her into a steamer of about 5000 tons. She was built in 1896, is 352 feet between perpendiculars, 42 feet in beam and 27 feet deep. She has been taken to Midland for the alterations. She will be operated by James Playfair.

* * *

The steamer COLONEL went ashore on Waverly shoal, near Buffalo, recently, but was released with only slight damage after part of her grain cargo had been lightered.

* * *

Succeeding the steamer ARROW, which was destroyed by fire, the freight and passenger steamer FRANK E. KIRBY on Nov. 15 terminated the season between Sandusky and the islands.

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On Oct. 31, the three ore docks at Superior had sent down 10,000,000 tons, the largest tonnage of ore since the war.

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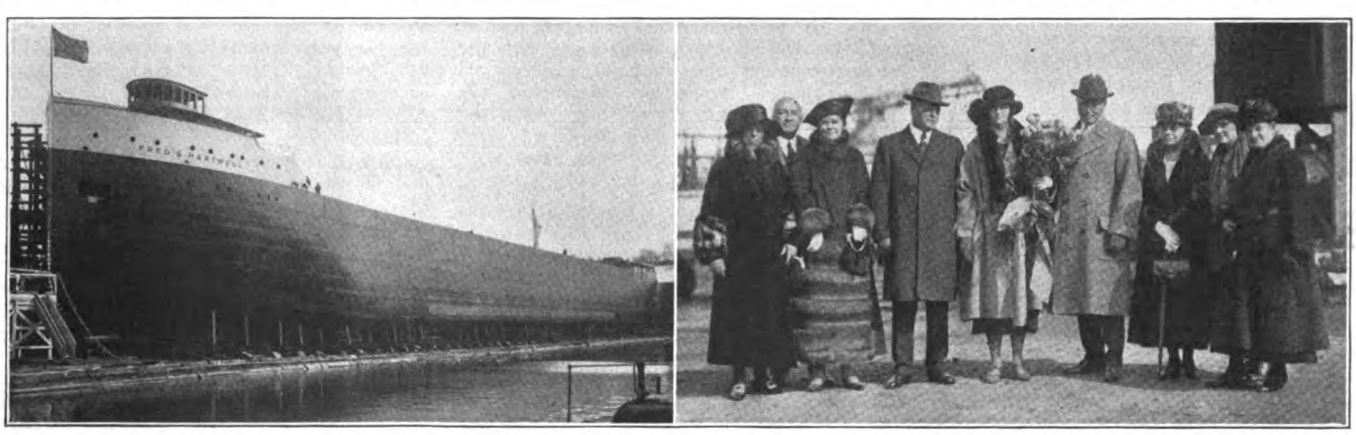
Sparks from a passing locomotive are believed to have started a fire which recently destroyed 400 feet of the old Wheeling & Lake Erie ore docks at Huron.

* * *

Capt. W. H. Kilby, 67 years old, died at Henderson, N. Y., Oct. 31, after a short illness. He had been with the fleet of the Pittsburgh Steamship Co. since it was organized and retired in 1919, his last command being the

Largest Lake Freight Steamer Launched

LAUNCHING of the steamer FRED G. HARTWELL at the Lorain yard of the American Shipbuilding Co. late in October added to the Oakes fleet the largest freighter on the Great Lakes. She is 617 feet over all, a foot longer than either the COL. JAMES M. SCHOONMAKER or the WILLIAM P. SNYDER JR., and 64 feet wide, five feet wider than the W. GRANT MORTEN, the longest freighter which is 625 feet over all. Her keel measures 596 feet and she is 33 feet deep. Her tonnage is expected to be approximately 13,500 tons. She is a single deck bulk freighter, built on the arch and web frame system, with a continuous double bottom and side hopper tank extending from the tank top to the under side of the spar deck, with main deck at forward and after ends only. She has 36 hatches 12 feet on centers and will be used in the ore and coal trade. The vessel was built for the Franklin Steamship Co. of which Herbert K. Oakes is manager. Miss Margaret Hartwell, daughter of Fred G. Hartwell, president of the Berwind Fuel Co., was sponsor for the new boat.



LEFT—THE STEAMER FRED G. HARTWELL BEFORE THE LAUNCHING; RIGHT—THE LAUNCHING PARTY, LEFT TO RIGHT, MRS. HERBERT K. OAKES, H. A. KELLEY, MRS. G. A. TOMLINSON, FRED G. HARTWELL, MISS MARGARET HARTWELL, HERBERT K. OAKES, MRS. FRED G. HARTWELL, MRS. FRED EMERY AND MRS. ALFRED EMERY

AUGUST ZIESING. Other vessels which had been under him were the COLGATE HOYT, J. B. COLGATE, FRANK ROCKEFELLER, ALEX MCDOUGALL, JAMES WATT, CORNELL, H. C. FRICK, GEORGE W. BAKER, and W. J. OLCOTT.

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Among the boats held in port with grain at Buffalo, while waiting opportunity to unload was the steamer W. G. MATHER of the Cleveland Cliffs fleet. She was held for 19 days, a record up to that time.

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The Detroit & Cleveland Navigation Co. at the end of October terminated its season's runs between Detroit and Buffalo, but planned operating between Detroit and Cleveland to Dec. 1, weather permitting.

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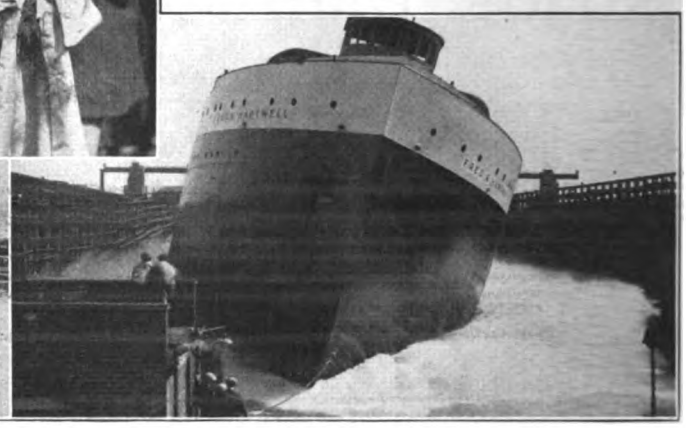
Rooms for licensed officers of the Lake Carriers association have been established on the fourth floor of the Commercial Bank building, Cleveland, and at West Chippewa and Pearl streets, Buffalo.

* * *

The steamer LAKE GEORGE is in the dry dock of the Superior Shipbuilding Co.



LEFT—FOLLOWING THE LAUNCHING, THE STEAMER FRED G. HARTWELL WAS TOWED OUT INTO THE LAKE AND TURNED AROUND. SHE IS SHOWN HERE HEADED FOR THE FITTING OUT DOCK; RIGHT—THIS SHOWS THE STEAMER AS SHE STRUCK THE WATER; ABOVE—MISS MARGARET HARTWELL, SPONSOR OF THE VESSEL NAMED FOR HER FATHER

Late News From Atlantic Seaboard

GROWTH of the port of Baltimore in recent years is shown in the fact that at the present time there are 55 steamship lines operating from the port, controlled by 47 companies, while in 1913, the last full prewar year, there were only 16 regular liner services operated by 13 companies.

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October registered slight declines in both exports and imports at Baltimore, but August and September were record months, particularly in inbound cargo. The terminal piers are still piled high with such goods awaiting distribution.

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During the fiscal year ended June 30, 1922, Baltimore sent 119,865 tons of freight to San Francisco on its intercoastal lines, taking second place among Atlantic ports in such shipments. Cargo shipped from San Francisco to Baltimore during the period reached 32,596 tons.

* * *

It has been announced that the Williams line, which operates regularly from Baltimore, plans a reorganization which will include an increase in sailings and a general branching out of its routes. Capital is to be increased from $3,000,000 to $4,100,000.

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The first report of the trial examiner in the case of the federal trade commission against the Baltimore & Philadelphia Steamboat Co., charging unfair methods of competition, has been made. The report, which does not represent the final decision of the board, states that the evidence submitted at the hearings does not substantiate the claim and recommends that the complaint be dismissed. The Marine Transport Corp. was the complaining party.

* * *

In addition to the motorship WILLIAM PENN, 12,500 deadweight tons which sailed from North Atlantic ports direct to Manila on Nov. 16, the shipping board has arranged to send the steamer RADNOR, 12,000 deadweight tons direct from Gulf ports to Manila in December. The WILLIAM PENN is under the managing agency of the Barber Steamship Co., and the RADNOR under the managing agency of the Tampa Inter-Ocean Steamship Co. The arrangement is in line with the board's intention to give improved service to Manila with direct sailings.

* * *

Edward E. Blodgett, chairman of the maritime association of the Boston chamber of commerce, and Frank S. Davis, manager of the association, have been delegated by Governor Cox to represent the state at the eighteenth convention of the National Rivers and Harbors congress in Washington Dec. 6 and 7.

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The governing board of the Maritime association, Boston chamber of commerce, recently elected the following to membership in the association: A. H. Bull Steamship Co., New York; M. C. Fitzgerald, transportation manager, General Electric Co., Schenectady, N. Y.; Coastwise Transportation Corp., Boston; and Capt. Caleb R. Kelley and Capt. Robert M. Lavender, port wardens, both of Boston.

* * *

Savannah showed in the fiecal year ending June 30, 1922, the largest clearances of export cargoes and Charleston the greatest entrances of import cargoes of all inbound and outbound shipping of the south Atlantic coast district, according to an analysis by the transportation division of the department of commerce. During the year ended 386 vessels of 2,210,046 deadweight tons entered the district, carrying 817,793 long tons of cargo, and 477 vessels of 2,961,585 cleared, carrying 1,311,663 long tons. American vessels comprised 69 per cent of the number and 68 per cent of the tonnage entering the district; and 58 per cent of the number and tonnage clearing.

* * *

Recent principal imports at the port of Boston have been bananas and other fruit from Jamaica and Port Limon; tea, soap, chalk and wool from London; olive oil, crockery, hemp and rubber from Mediterranean points; pelts and sheep skins from New Zealand points; oil from Tampico; rattan, hemp and fire crackers from oriental ports; sugar from Cuba and coal from New Castle and Liverpool. Principal exports include

match blocks for Glasgow; food stuffs for Halifax and St. Johns; machinery, emery wheels, and grain for Liverpool; rugs, grain and leather for London; flour and lard for Hamburg, and machinery for Rotterdam.

* * *

Baltimore's import coffee trade continues to grow. In the first nine months of 1922 coffee receipts amounted to 79,508 bags. During 1921 the port's coffee imports were 61,396 bags, in 1920 they were 28,517 bags and in 1919, 2372 bags.

* * *

Import coal to reach the port of Baltimore during the recent movement has reached 81,425 tons. All of this was Welsh fuel with the exception of one shipment of gas coal from Hamburg.

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Work on dredging 2,475,000 cubic yards of material from the channels leading to Baltimore has been started by the Arundel Corp., under contract with the Baltimore district of the United States engineer corps.

* * *

Carrying 646,000 bushels of oats, the British steamer VOREDA, cleared recently from Baltimore for Venice. This is the largest cargo of that grain ever exported through Baltimore and, it is said, is the largest on record from any port. The vessel was cleared by the Terminal Shipping Co.

* * *

Exports of grain through the port of Baltimore for September reached 6,627,297 bushels, in comparison with 3,257,233 bushels in September, 1921. Since Jan. 1 grain exports there have amounted to 71,507,955 bushels, as opposed to 45,438,939 bushels during the same period of last year.

* * *

H. A. Lane, chief engineer of the Baltimore & Ohio railroad, has announced that contract has been entered into with the John S. Metcalf Co., Chicago, specialists in grain elevator construction, for the preparation of plans and specifications for the new grain elevator facilities at Locust Point, Baltimore, in replacement of the two old elevators destroyed by fire July 2. The tentative plans call for a steel concrete elevator with capacity of 3,000,000 bushels, so arranged that it can be readily increased to 8,000,000 bushels. The plans include complete facilities for drying and cleaning grain, also provisions for unloading grain from boats. The elevator will be constructed adjacent to piers, with galleries and belt conveyors reaching eight berths, four of which will be located on an exclusive grain loading pier, to be constructed for that purpose, the other four on a 2-story merchandise pier already in use.

* * *

Joseph E. Sheedy, vice president of the Emergency Fleet corporation, in charge of operations, has announced that there has been received from the French government, through Capt. J. Rigal, F. N., naval attache at Washington, bronze and silver medals and diplomas in testimony of the bravery and devotion to duty displayed by the crew of the shipping board steamer CRANFORD in rescuing at sea the crew from the stranded French steamer VICTORIEUX, which foundered in the Atlantic ocean on Feb. 10, 1921.

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The C. & T. Intercoastal line, operating from Baltimore and other Atlantic ports to the Pacific coast, has announced it is putting two new steamers on the run and will maintain a regular 12-day service.

* * *

Baltimore's position in the iron importing trade is indicated by the large amounts of pig iron now passing through. It is the heaviest movement of this commodity since 1913. The importations at this time are said to be caused by the coal shortage and most of it moving to eastern steelworks.

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The auxiliary schooner yacht GOODWILL, which is being built for Keith Spalding, of Chicago, by the Bethlehem Shipbuilding Corp., Ltd., was launched late in October at the Harlan plant, Wilmington, Del. The yacht, designed by Henry J. Gielow, naval architect, New York, is a 2-masted schooner measuring 161 feet overall with a beam of 30 feet, a depth of hold of 21 feet, and a draft of 15 feet 3 inches. The auxiliary propelling machinery will consist of a 6-cylinder diesel engine burning heavy oil.

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Surplus material owned by the shipping board at Sparrow's Point, Md., will be disposed of by public sale on Nov. 22, at the Baltimore yards. It consists chiefly of anchors, boilers, distillers, filters, chains, generator sets,

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Following decision of the interstate commerce commission to establish a parity in rail rates on export tobacco between Kentucky and Ohio shipping points and the Gulf and northern Atlantic, Baltimore is again on a basis to share in this movement.

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Moore & McCormack have established a new service from Baltimore to Houston, Tex., and cleared the first vessel early in November. THE COMMERCIAL SCOUT was the steamer and one vessel monthly thereafter will be sailed. The Terminal Shipping Co. is Baltimore agent.

* * *

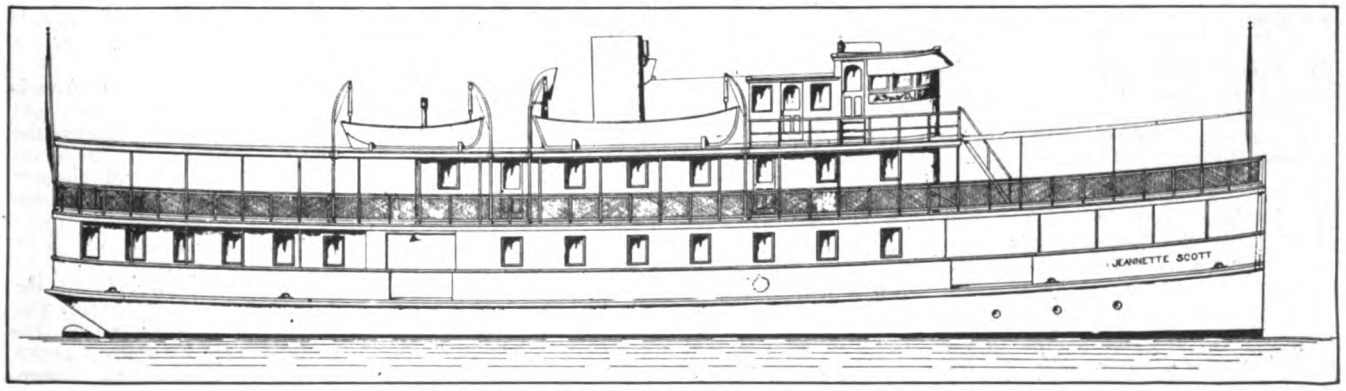
Norfolk's new grain elevator, the first unit of the new municipal waterfront terminal to cost $5,000,000, recently was completed and in operation, receiving grain from the great farming sections of the Middle West for shipment to European markets. The grain elevator and the bulkheads and jetties that go with it were built at a cost of slightly more than $1,000,000. This includes the electrical operating machinery. Later, a merchandise pier and a series of open wharves and warehouses will be built, bringing the total cost of the whole terminal system up to about $5,000,000.

* * *

The American Line, subsidiary of the International Mercantile Marine Co., and operating a general cargo service between Hampton Roads and Hamburg, Germany, recently inaugurated a monthly service to Bremen with the sailing of the steamer

Building Combined Freight and Passenger Vessel for Florida Waters

A NEW ship JEANNETTE SCOTT, designed by Cox & Stevens and building under their supervision for the Adams Boat Line, Inc., is approaching completion at the yard of the Murnan Shipbuilding Corp., Mobile, Ala. This vessel is 120 feet over all, has a beam of 25 feet 6 inches, is equipped with two oil engines delivering 240 brake horsepower, will draw 4 feet 10 inches loaded and is for combined passenger and freight service in Florida waters. She will trade between Tampa, St. Petersburg, Manitee river and Sarasota bay towns.



OIL ENGINED PASSENGER AND FREIGHT VESSEL FOR GULF SERVICE

MONTAUK. The new service will be furnished by American flag vessels and operated on a monthly basis until business warrants additional sailings. The line is prepared to increase the service any time cargo offering demanded.

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The Merchants & Miners Transportation Co. has announced that the names of its two new steamers now being built by the Federal Shipbuilding Co., Newark, N. J., will be the ALLEGHENY and the BERKSHIRE. The first is expected to be ready in January and the second in February.

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Co-operating with the Clyde Steamship Co., the New York, Wilmington & Fayetteville Steamboat Co. has announced a schedule of freight and passenger service between Baltimore, New York, Wilmington and Fayetteville, N. C.

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Baltimore's imports of Brazilian and other coffees since the beginning of the present year have amounted to 93,766 bags. This figure is in comparison with imports of 61,396 bags in 1921, 28,517 bags in 1920, and 2372 bags in 1919. Two additional vessels with Baltimore coffee are expected shortly and it is estimated that the entire year's total will reach at least 125,000 bags.

* * *

Grain exports at Baltimore for October amounted to 4,259,206 bushels in comparison with 2,183,217 bushels in October, 1921. Since Jan. 1 this year Baltimore's grain exports have reached 76,016,403 bushels while during the same period of last year the figure was 47,622,156 bushels.

* * *

The Baltimore Steamship Co. has decided to add a passenger feature to its Porto Rican service. The steamer GOVERNOR JOHN LIND has gone into drydock to be fitted with 16 staterooms.

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The steamer TAMPICO, owned by Crowell & Thurlow, was sold recently to Great Lakes interests. She will be placed in operation from Detroit to other Great Lakes ports.

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The purchase of the steamer PLAINFIELD by the Baltimore & Caroline Steamship Co. from the shipping board completes the plan of that line to have two passenger steamers added to the line for operation between Baltimore, Charleston and Miami.

Along the Gulf Coast

APPROXIMATELY $250,000 was received for the property of the International Shipbuilding Corp. at Pascagoula, Miss., at the recent 3-day auction. The property cost the Italian government about $15,000,000. Three large steel vessels 95 per cent complete remain to be disposed of. The corporation's town of 250 buildings was bought for $81,000 by W. M. Colmar, H. F. Gautier, Thomas G. Kell and Dr. William F. Martin, of Pascagoula.

* * *

Adolph Felsenthal, of Camden, Ark., head of a group of citizens of Monroe, La., and El Dorado and Camden, Ark., is planning a barge line on the Ouachita, Black, Red and Mississippi rivers to begin operations next year when the federal government has finished the locks and dams on the Ouachita between Harrisonburg and Camden.

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Arrangements are being made to include Gulfport, Miss., among the harbors used by the Mississippi-Warrior barge lines.

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The New Orleans port commission has eliminated wharfage and tollage charges on lighters. Few lighters are used in the harbor at present. An effort is being made to increase their use.

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The All-America Cable Co. has landed its cable from Rio Janeiro, Brazil, and Balboa, Panama, at Morgan City, La., and has opened an office in New Orleans.

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A return of $121,000 to the government and a saving of $850,000 to shippers are the salient features of a statement of the Mississippi-Warrior finances for the past fiscal year. Sand bars formed by silt as the river went down after the floods in the spring hampered the service for four weeks between Cairo and Memphis.

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Capt. K. Kotani of the K line stated in New Orleans recently that unless the cost of handling grain in bulk could be reduced there the K line would withdraw its vessels. The K line vessels calling at New Orleans have been carrying grain to Mediterranean ports.

* * *

The steamship WEST GREYLOCK, assigned early in October to the Tampa-Interocean Co. for service on the Gulf-Far Eastern berth, has been sold by the shipping board to the Luckenbach line and will be used in the North Atlantic-Gulf-Pacific coast trade. The Luckenbachs recently sold the PLEIADES and the HATTIE LUCKENBACH, used in intercoastal trade, to Garcia & Diaz of New York. The WEST GREYLOCK is 12,000 tons deadweight. The DRYDEN, assigned to the Tampa-Interocean in her place, is 10,375 tons.

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The Todd Dry Dock & Ship Building Corp. has reduced its dock rates at Mobile from 20 to 16 cents per ton for the first 24 hours and from 15 to 14 cents thereafter. The other docks at Mobile so far retain the old rates.

* * *

William H. Todd of the Todd Dry Dock & Shipbuilding Corp. told the New Orleans dock interests in October that if they do not beat the O'Connor bill, which has passed the house of representatives, the 15,000-ton naval dock may be leased to operators who will remove it from New Orleans. A number of the New Orleans dock men are apparently opposed to the leasing of the naval dock.

* * *

Sale of the interests of the Bluefields Fruit & Steamship Co., which includes a half interest in the New Orleans & Bluefield Fruit & Steamship Co. to the Cuyamel Fruit Co., of which Samuel Zemurray is the chief stockholder, is reported to have been completed. All three companies operate between New Orleans and Nicaraguan ports and the Bluefields has a line touching Kingston, Jamaica. The Cuyamel also owns and operates sugar and banana plantations.

* * *

A hitch in the progress of the ship channel proposed for the route from Lake Charles, La., to the mouth of the Sabine river south of Orange, Tex., occurred recently when the Union Sulphur Co. of New Jersey, owner of the sulphur mines in Calcasieu parish near Lake Charles, obtained an injunction against the levying of the tax for a total of $2,750,000 of bonds on the ground that citizens of Lake Charles had no legal right to vote in the recent election. An appeal has been taken to the Louisiana supreme court.

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The LAKE HECTOR, the steel sea going tug BARSTOW and $50,000 have been turned over to the Argentine government by the shipping board as part compensation for the sinking of several small vessels of the Argentine navy by the AMERICAN LEGION at Buenos Aires. The money is for the families of the crews who lost their lives when the AMERICAN LEGION got out of control.

* * *

The New Orleans port commission is having plans drawn to restore the wharf house at the army supply base warehouse destroyed by fire in September. Immediate construction of 2000 feet of wharf on the industrial canal at a cost of approximately $1,500,000 has been decided on. The Lukens Steel Co., Coatesville, Pa., has taken a site on the canal and will invest, it is reported, about $300,000 in buildings and equipment.

* * *

The port commission has ordered the construction of another grain reconditioning plant at the public elevators.

* * *

Morgan line officials will file a libel for $100,000 against the Japanese steamer GLASGOW MARU which collided and sank the tug LOUISE at Galveston recently it is stated.

* * *

World Ports, organ of the American Association of Port Authorities, will be published in New Orleans during the term of Tiley S. McChesney as secretary of the association. Mr. McChesney is assistant general manager for the New Orleans port commission.

* * *

Fire was discovered in a hold of the British steamer NORWEGIAN as she was preparing to put to sea at Galveston, recently. The fire boat CHARLES CLARKE and the city fire apparatus played streams of water in the hold and in the bunkers.

About 300 bales were found to be damaged out of 2600 that were aboard. The NORWEGIAN reloaded her cargo within the week and sailed for Liverpool.

* * *

Gulf operators lost their fight for a change in the method of letting stevedoring when T. V. O'Connor of the shipping board rejected their arguments, stated that costs had been cut by letting the work as at present and that they were not injured by alleged discrimination.

* * *

On the arrival of the steamship SAN JACINTO off Miami recently, H. H. Raymond, president, and other officials of the Mallory Steamship Co., went ashore in a tender to test out the possibilities of landing passengers at the Florida resort in that manner until the channel has been sufficiently deepened to permit the SAN JACINTO to berth alongside the pier. The landing was made without trouble of any kind and indications are that Miami will, for the first time, be included in the direct New York passenger service of the Mallory line.

* * *

The 2-story wharf house of the army supply base warehouse at New Orleans was destroyed recently by a fire that started in a shipment of burlap in a box car on an adjacent track and was swept under the floor of the wharf by a strong wind. A great deal of merchandise and a number of box cars were burned. Three German sailors lost their lives. None of the ships at the wharf was damaged as they were gotten away in time. The alarm was not turned in for 40 minutes after the fire was discovered. The elaborate sprinkler system was not in operation because the watchman did not have the key. The fire engines were delayed and hampered by the automobiles that gathered in the only paved route to the site.

* * *

CAPT. L. A. KAISER, United States navy, formerly governor of the naval home at Philadelphia, has arrived in Galveston and relieved LIEUT. COM. C. E. PUGH, retired, as officer in charge of hydrographic office. Captain Kaiser graduated from the United States naval academy in the class of 1889 and saw service in the Spanish-American war and the world war.

Activities Along the Pacific Coast

ALLOCATION of the shipping board steamships SUSQUEHANNA, PRESIDENT HARRISON and PRESIDENT HAYES to an express service between North Pacific ports and the east coast of South America is received with approval in shipping circles. For three years freighters have been on this route. Now with faster cargo service in addition to passenger, it is expected to develop new markets and establish closer relations with countries until recently cut off from the North Pacific.

* * *

The supreme court of Washington is considering the constitutionality of the 1922 amendment to the admiralty statutes depriving federal district courts of jurisdiction in damage actions involving stevedores in states having workmen's compensation laws. The action was brought by the state to collect industrial insurance premiums.

* * *

The port of Tacoma has awarded contracts for the monorail and crane hoisting system for the new transit shed. The monorail contract went to the Pawling, Harnischfeger Co., Milwaukee, on a bid of $40,000. The Colby Steel & Engineering Co. will build two cranes at a cost of $43,650.

* * *

To establish a fueling station the General Petroleum Co. has leased from the port of Seattle a 2,500,000-gallon oil tank. This company furnishes fuel oil for shipping board vessels and extensive improvements and increased facilities will be installed at the Smith Cove terminals. Fueling has been done by barges.

* * *

The Pacific Foreign and Domestic trade council held its second annual convention at Tacoma Dec. 14 and 15. This organization was formed a year ago for the purpose of fostering trade from that section.

* * *

Six former German steamers, recently purchased by W. L. Comyn & Co., have been placed under the flag of Panama and have been assigned to general service in the Pacific. The owners are now loading the first of this fleet with a cargo of lumber for Australia. The steamers will be manned by German officers. Panama registry was adopted because of the favorable provisions of the laws of that republic.

* * *

Officials of Bellingham, Wash., have authorized the purchase of additional terminal equipment to handle the increased commerce passing through that port. During the third quarter of this year 6309 tons were handled over the municipal terminals compared with 3786 tons in the same three months last year.

* * *

Fishermen of a small halibut vessel recently arrived at Seattle each received $505 for two weeks' work.

* * *

Silk in increasing quantities is arriving from Japan at Pacific ports for immediate shipment to Atlantic centers. One of the largest of recent consignments came on the Japanese steamer HAKATA MARU. This shipment amounted to 6000 bales valued at $7,000,000.

* * *

Whaling off the British Columbia coast has terminated for the season. The total catch was 187 whales.

* * *

With the government's annual take of sealskins the steamship BROOKDALE arrived recently at Seattle from the Pribilof islands. The vessel brought 30,000 skins valued at $4,000,000.

* * *

With the announcement that the Munson Steamship Co., will operate in the intercoastal trade, the Pacific Steamship Co. has been appointed agents for the Pacific coast and British Columbia.

* * *

The steamer SANTA CRUZ, built at San Francisco in 1868 and ever since in active service from Nome to Mexico, has been rebuilt and changed into a oil burner and under the name of TREBLA is now engaged in towing out of Vancouver, B. C.

* * *

Two underground concrete tanks have been leased by the port of Seattle to the Hawaiian Molasses Co. The importers are bringing an average of 1000 tons of bulk molasses per month and the port property will be used for storage. The Hawaiian product is an ingredient of cattle feed.

* * *

Activity of I. W. W. agitators at Portland has given shipping interests no little concern during the month. An incipient strike among the longshoremen was broken by the prompt action of city and state officials. Quiet is now reported on Portland's waterfront.

* * *

British Columbia's salmon catch this year totaled 1,017,696 cases, much of which has already been shipped to United Kingdom and Australia.

* * *

On the VICTORIA'S last trip down from Nome, Alaska, she brought $750,000 in gold bullion, the early spring clean up in the far northern mining camps.

* * *

To make Seattle an attractive port for the grain movement, the port commission has put into effect reduced rates on grain and changes in grain handling rules. Wharfage is reduced from 40 cents to 30 cents a ton. Elevating of grain in bulk is cut from 50 cents to 40 cents a ton. Elevating of grain in sacks is down from 65 cents to 60 cents a ton. Rules changed were so that screenings are turned over to the owners of the grain instead of being kept by the port. Cost of sewing bad order sacks is reduced from 5 cents to 3 cents each and cost of resacking grain from torn sacks reduced from 15 cents to 7 cents a sack.

* * *

In the first half of November, around 34 big ocean carriers, including steamships and motorships sailed from Seattle and north Pacific coast ports for various ports of call in North Europe, and practically all these vessels are assured of big cargo offerings if not booked full at this time. The vessels represent 12 steamship concerns, only two of which are American lines. Certain of these ships will inaugurate the annual fall movements of fruit, including apples, from that port to the continent.

New Trade Publications

FLOORS—The Marine Decking & Supply Co., Philadelphia, has published a 24-page illustrated booklet in which modern flooring methods are described and illustrated. The booklet chiefly is devoted to describing flooring material manufactured by the company. This material is said to have given exceptionally satisfactory service upon the decks of ships and in industrial plants. The principal ingredient is calcined magnesite, which is mixed dry with certain fillers to give the finished floor a hardness commensurate with elasticity. To this is added a magnesium chloride solution which brings it to a plastic state in which it is applied to the floor or foundation. The composition hardens over night, presenting a smooth, level surface, unbroken by seams. It is noninflammable.

BOILERS—For the convenience of its customers, the Babcock & Wilcox Co., New York, has arranged a catalog listing the various materials which may be required from time to time in connection with the operation and upkeep of its boilers and which may be obtained through any of its storerooms, located at New York, Baltimore, Norfolk, New Orleans and San Francisco. This catalog has been made as comprehensive as possible, all with a view of obviating any confusion in the ordering of spare parts and tools.

ASH EJECTOR—An 8-page illustrated booklet has been published by the Victor Engineering Co., Philadelphia, in which ash ejectors are described and illustrated. These ejectors are operated solely by a steam nozzle which in service directs a jet of steam through an inclined pipe, thereby creating a powerful suction in the horizontal section of the ejector located under the floor and a high pressure beyond the nozzle up to the discharge end. According to the booklet as an example of the ejector's economical operation, between two ports a 10,000-ton vessel will consume 300 tons of coal. At 10 per cent the total amount of ash produced on the trip would be 30 tons. On the average vessel the ash ejector would be equipped with a nozzle of a ¼-inch diameter at its throat with a capacity of ejecting five tons of ashes per hour. Should the trip take six days the ejector would have to be operated for a total of one hour per day or for a period of 10 minutes in each watch of four hours. Inasmuch as the ejector is immediately operative upon its steam valve being turned on, there is no time lost in ejecting ashes before and during these periods.

PANEL BOARDS—The Sprague Electric works of the General Electric Co., New York, is circulating a leaflet in which safety-type panel boards and cabinets are described and illustrated. These panels and boards are designed for places where the bus-bars and other live parts must be covered, yet the fuse plugs left accessible.

Business Changes Recently Announced

THE Radio Corp. of America has entered into a contract to buy the White Oil building at 64-68 Broad street, New York, from the White Oil Realty Co., through the Brown Wheeler Co., at a cost of approximately $1,000,000. The buildbuilding is 10 stories high, contains 43,000 square feet and probably will be renamed Radio House. It will be remodeled at once to meet the needs of the corporation and to house the executive, sales and engineering departments of the which are now in the Woolworth building.

* * *

The Goetze Gasket & Packing Co., New Brunswick, N. J., has removed its New York branch from 242 Lafayette street, to the Hudson Terminal building, 50 Church street where King & Shepard will act as sales representative.

* * *

The Royal Mail Steam Packet Co., the Pacific Steam Navigation Co., the Union Castle line, and the Nelson lines have opened offices at 607 Boylston St., Copley Square, Boston. Passenger business principally will be handled from this office.

* * *

The Power Specialty Co., 111 Broadway, New York, has appointed Pell W. Foster Jr., of the New York sales office, New England district manager with headquarters at 50 Congress street, Boston.

* * *

Lunham & Moore have moved their offices from 27 Beaver street to the Cunard building, 25 Broadway, New York.

* * *

The American-Hawaiian Steamship Co., has appointed Richard Meyer & Co. local agents at New Orleans for a monthly schedule out of Mobile and New Orleans to Pacific coast ports.

* * *

New offices in Baltimore of the United American Lines, combining the European service from the port of that company, with the recently introduced American-Hawaiian line, is now in full operation. John Sanderman is local manager.

* * *

The Mississippi Shipping Co.'s Delta line operating shipping board vessels, now has agents at all Brazilian ports. R. E. McNeill is in charge at Santos, S. C. Shill is agent at Rio, J. H. Rown at Bahia and Cruz, and Sobrinos & Co. at Victoria. A subagent at Pernambuco soon will be appointed.

* * *

All departments of the main offices of the Prest-O-Lite Co., Inc., have been moved from New York to Indianapolis where headquarters have been established in the Speedway plant.

* * *

Kirk & Tunison, 80 South street, New York, doing a general ship, freight brokerage and chartering business, has been formed as a co-partnership by Frederick A. Kirk, formerly of Kirk & Treene, Inc., and P. F. Tunison, formerly general manager of the New York & Argentine Steamship Co., Inc.

* * *

The Los Angeles Shipbuilding & Drydock Corp. has appointed Berry E. Dunn as its San Francisco representative and has moved its offices in the northern California port to the Balfour building.

Business News

The East Baltic line, New York, capitalized with $100,000 has been chartered in Delaware to operate steamships.

Camden Yacht Building & Railway, Inc., Camden, Me., has been organized with $100,000 capital. Alan L. Bird is president.

The Portland & Rockland Steamship Co., Inc., Portland, Me., has been organized for $100,000. M. F. Jackman is president.

The Great Northern Steamship Co., Boston, has been incorporated for $500,000. Norman D. Tucker is president.

The Bethlehem Shipbuilding Co. has bought the Simpson shipyard and drydock at East Boston, Mass. The purchase of this plant will give additional repair facilities in Boston harbor, and will do away with towing some of the repair work down to Quincy Point and then back to Boston harbor. S. Wiley Wakeman, general manager of the Fore River plant of the Bethlehem Shipbuilding Corp., will manage the new plant.

The Castrian Steamship Co., Ltd., Montreal, Que., has been incorporated to build and operate steamships, etc., with $200,000 capital stock by John E. Grivell, B. M. Rogers and M. McLeod.

The Philadelphia Boat Co., Philadelphia, plans a 1-story boat house, 50 x 100 feet.

Late Marine Patents

Copies of any one of these patents can be obtained by forwarding 25 cents in stamps to Siggers & Siggers, patent attorneys, National Union Insurance building, Washington, and mentioning MARINE REVIEW

1425615—System of ship propulsion, Wilfred Sykes, assignor to Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.

1428238—Submersible pump and the like, John B. Keating, Piedmont, Cal.

1428369—Boatswain's seat, Pasquale Giannone, Philadelphia.

1428461—Nonsinkable vessel, Henry F. Waitz, New York.

1428538—Method of and apparatus for raising submerged vessels, Frederick W. Eberling, New York, assignor to Submarine Devices Corp., Delaware.

1428809—Boat crane, Frank R. Zimmerman, Superior, Wis., assignor to Superior Iron Works Co., Superior.

1429156—Sailboat, C. Moraitis, Galveston, Tex.

1429379—Ship's light, Thomas Utley, Liverpool, England.

1429773—Life saving and swimming apparatus, Joseph Reiter, New York.

1429941—Submarine boat, Oswald Flamm, Nioclasse, near Berlin, Germany.

1430162—Apparatus for detecting and indicating the presence of submarine boats, Giovanni E. Elia, New York.

1430516—Ship's davit, Peter Vanderwhl, Brondesbury, London, England.

1430708—Ship, Charles C. West, Manitowoc, Wis., assignor to Manitowoc Ship Building Corp., Manitowoc.

1430773—Method and apparatus for freeing the bottoms of vessels from barnacles and the like, James W. Van Meter, San Rafael, Cal.

1430957—Method of and apparatus for raising sunken ships, Diamond Diamantides, Canonsburg, Pa.

1431221—Apparatus for operating the starting device of water turbines or the like, John E. Englesson, Khristenhamm, Sweden.

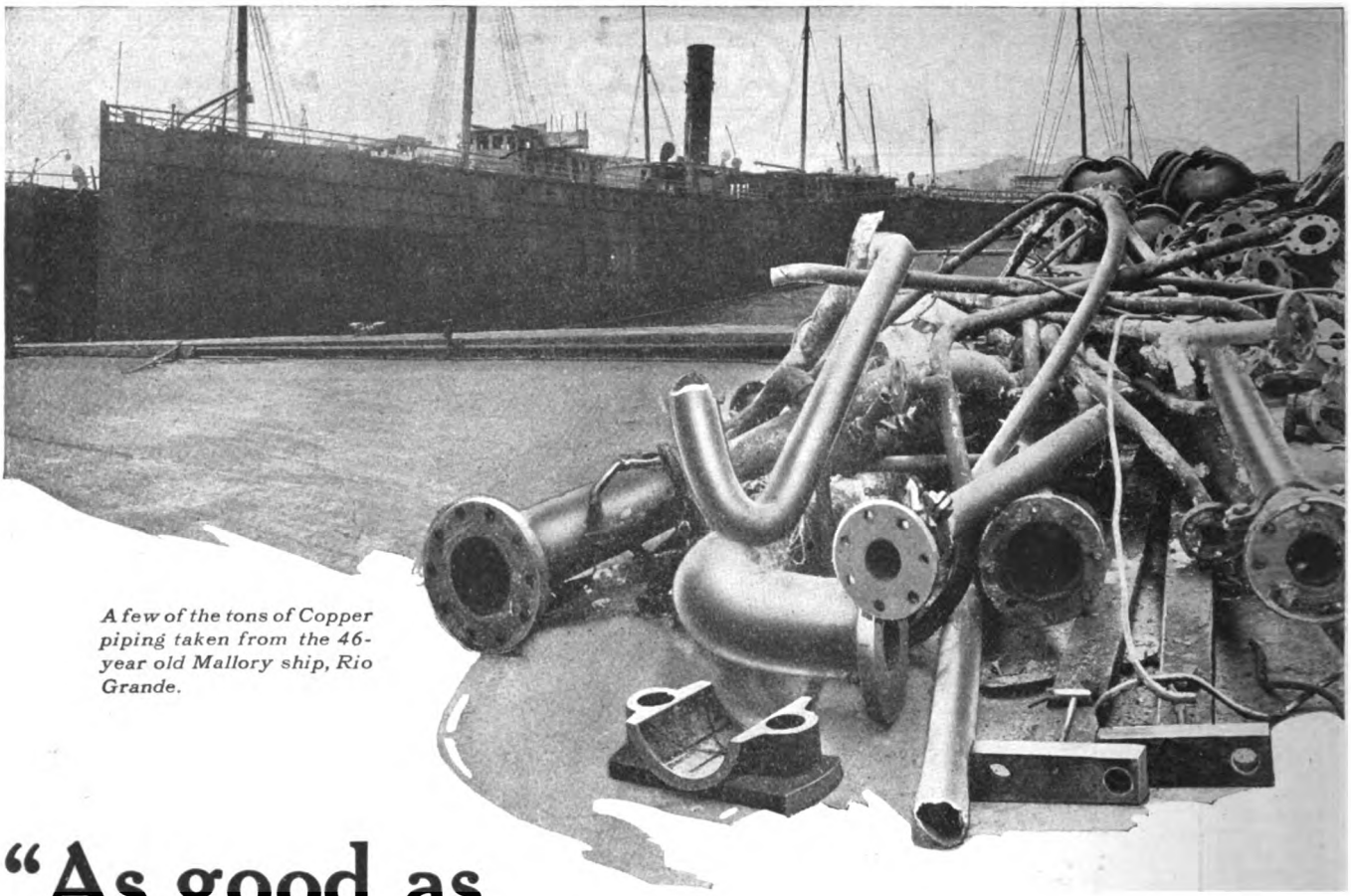
The barkentine ANNE COMYN recently loaded the first full cargo of Alaska spruce lumber ever shipped to an offshore point out of the northern territory. The spruce was loaded at Ketchikan.

December, 1922

Marine Review

THE BUSINESS OF TRANSPORTATION BY WATER

NEW YORK CLEVELAND LONDON



A few of the tons of Copper piping taken from the 46-year old Mallory ship, Rio Grande.

"As good as the day it was put in!"

As the yard owner who is wrecking the old ship said: "Some piping!—clean as a whistle, and as good as the day it was put in!"

The Rio Grande has logged her last knot, but the Copper and Brass that were in her still live and are giving their everlasting qualities to other services—perhaps to other ships

What other metals could have withstood the racking strain of 46 years of continuous duty in this floating power plant?

Copper and Brass are cheaper because you pay for them only ONCE

COPPER & BRASS RESEARCH ASSOCIATION

25 Broadway ~ New York

That You Can Trust

All machinery used on shipboard needs to be reliable; but in the case of a boiler feed pump, every other requirement is subordinate to reliability.

If the feed pump fails, the result is sure to be troublesome—perhaps disastrous. This is especially true with water tube boilers where a steady supply of water is necessary on account of the small quantity contained in the drums.

Absolute dependability at all times and under all conditions is the standard aimed at in the building of Bethlehem-Weir Feed Pumps.

Of course Bethlehem-Weir Pumps possess those other qualities an all-round satisfactory feed pump needs—economy in steam consumption—slow speed and quiet operation, preventing shocks in the feed pipe due to pressure surges—high mechanical efficiency—small floor space required.

But reliability comes first.

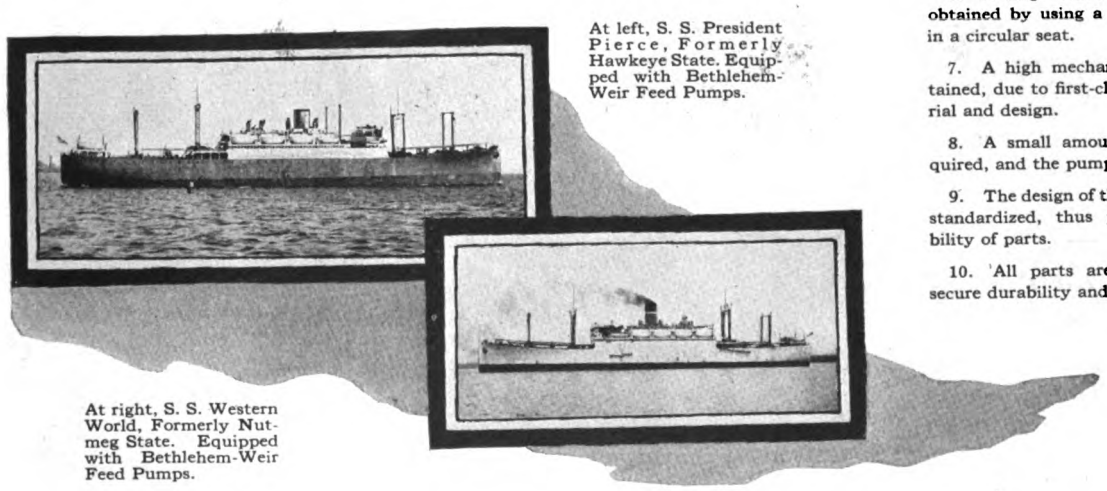
It is the year-in-year-out reliability of Bethlehem-Weir Feed Pumps that underlies their wide acceptance by marine engineers.

And the numerous installations in vessels of every type furnish some gauge of how successfully the Bethlehem-Weir Feed Pump meets all the requirements of service at sea.

BETHLEHEM SHIPBUILDING CORPORATION, Ltd.
BETHLEHEM, PA.

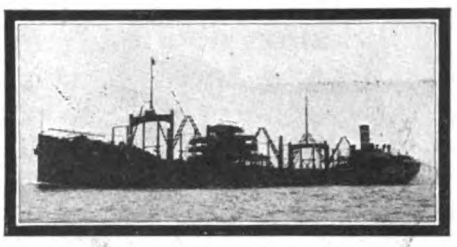
General Sales Offices: 25 BROADWAY, NEW YORK CITY

Sales Offices:
Boston Philadelphia Wilmington, Del. Baltimore San Francisco



At left, S. S. President Pierce, Formerly Hawkeye State. Equipped with Bethlehem-Weir Feed Pumps.

At right, S. S. Western World, Formerly Nutmeg State. Equipped with Bethlehem-Weir Feed Pumps.



S. S. Bethore 20,500-Ton Combination Ore and Oil Carrier. Equipped with Bethlehem-Weir Feed Pumps.

These are the Advantages of the Bethlehem-Weir Feed Pump

1. They are designed to work at a moderate speed, thus insuring longer life and more satisfactory operation than pumps running at a high speed.

2. They operate quietly. The special type of steam valve causes the pumps to slow down toward the end of the stroke, and consequently the water valves settle quietly in their seats. This action of the valves also prevents any jar or shock in the feed pipes, as there is no sudden reversal of the piston.

3. The steam valve, a very important feature, is very simple in construction; it consists practically of only two moving parts, thus reducing wear and tear to a minimum.

4. The pumps are economical in steam consumption.

5. There is no dead center; the pumps will start at any part of the stroke. The length of stroke can be adjusted in a few minutes, and when once adjusted, it is constant at all varying speeds and pressures.

6. A large valve area with small lift is obtained by using a number of small valves in a circular seat.

7. A high mechanical efficiency is maintained, due to first-class workmanship, material and design.

8. A small amount of floor space is required, and the pumps are easy to install.

9. The design of the various parts has been standardized, thus providing interchangeability of parts.

10. All parts are so constructed as to secure durability and low upkeep cost.

WEIR MARINE AUXILIARY MACHINERY

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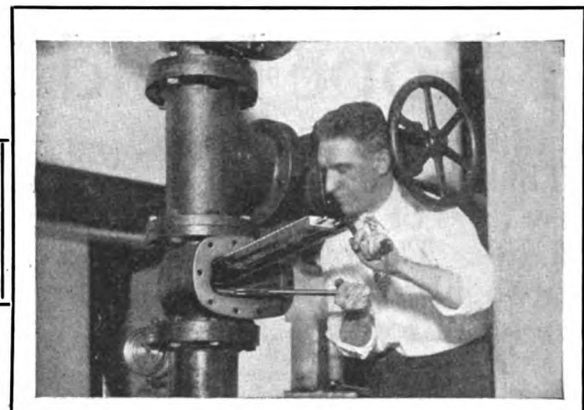


The Dexter

Gate Valve Reseating Machine

—for Reseating All Gate Valves 1½ to 16 in. without disconnecting the valves from the pipe

A Great Labor and Valve Saver

The Dexter method of recutting gate valve seats and gates or split discs leaves the seating surfaces in the same relation to each other as when new. The angles are not changed in the least, a result that is absolutely essential for a tight valve—and it does not require a skilled workman to do the job.

The cutter support is quickly attached to the valve and the feed stud centered with relation to seat to be faced. This simple adjustment is operated and controlled by merely turning of crank handle attached to the screw threaded spindle. This one simple operation attaches cutter support to valve and centers the feed stud.

Dexter Gate Valve Reseating Machines will save enough time and power the first time used, to pay their cost many times over.

Catalog gives full details. May we send one?

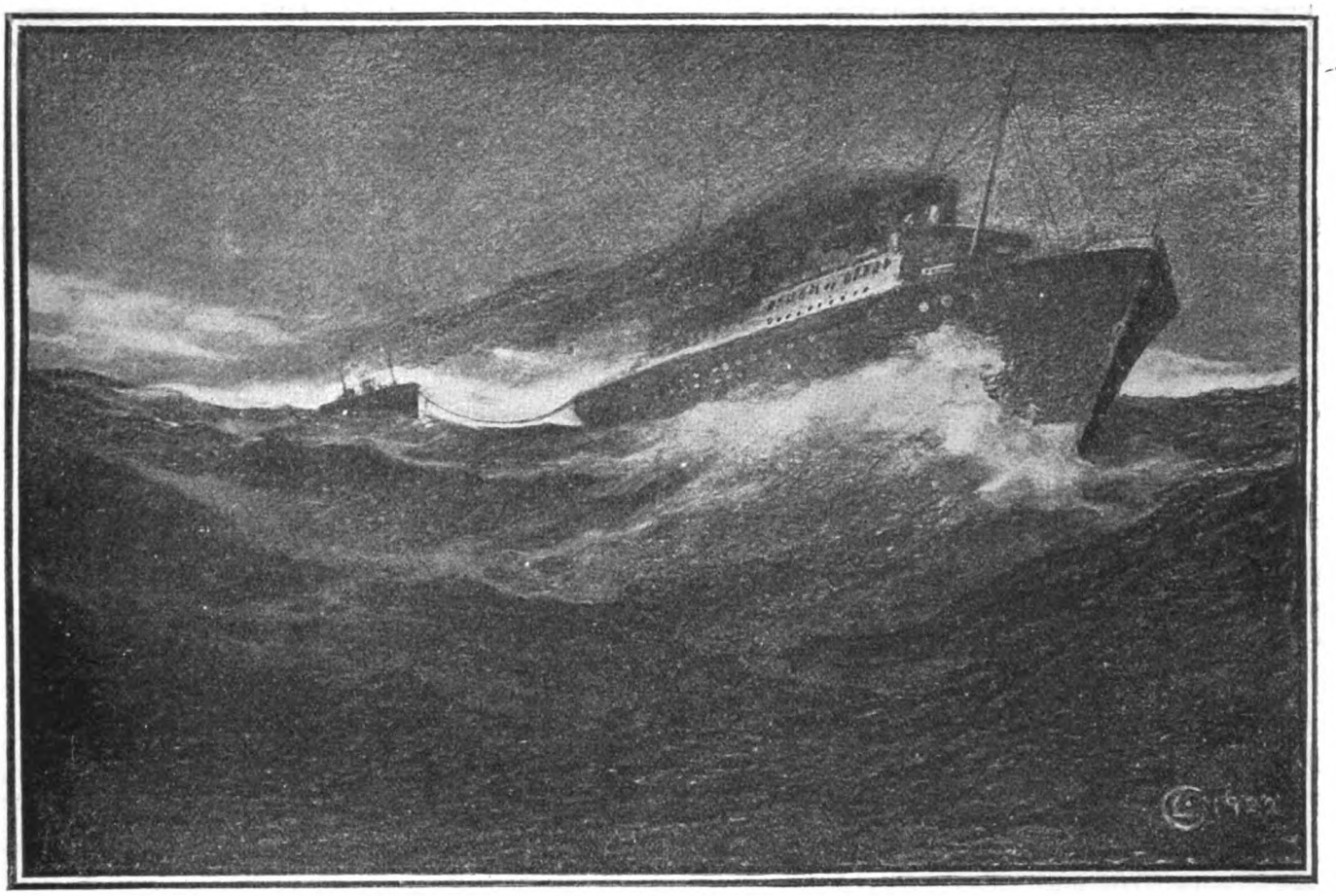
The Leavitt Machine Company

15 E. RIVER ST., ORANGE, MASS., U. S. A.

Canadian Agency
Darling Bros., Ltd.
120 Prince St., Montreal

Makers of Dexter Globe, Gate and Pump Valve Reseating Machines

British Agency
Cromil Engineering Co.
E. Floor Milburn House
Newcastle-on-Tyne



No Service Too Rugged For PLYMOUTH ROPE

PLYMOUTH Rope is made for service that taxes a rope to its utmost.

When lives and property are dependent upon a length of rope, the use of Plymouth Manila brings that feeling of security and safety that no other rope can create. For under all conditions Plymouth is the Rope You Can Trust.

Made of pure Manila fiber, by methods that have been developed by a hundred years of practical manufacturing, Plymouth Manila Rope combines at once, strength, lightness and exceptional wearing qualities.

Plymouth Manila Tow Lines are but one of many specialized Plymouth Ropes for marine use.

PLYMOUTH CORDAGE COMPANY
North Plymouth, Mass. Welland, Can.

PLYMOUTH *The Rope You Can Trust*

4603

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America's Greatest Ship

— the Leviathan — is Columbian Equipped

The stupendous task of repairing and equipping the mammoth ***Leviathan*** calls for the finest materials made. Hence, Columbian—the only rope containing the famous red, white and blue ***Tape-Marker*** Guarantee **—has been selected by the Newport News Shipbuilding and Dry Dock Company for this important work.**

Columbian *Tape-Marked* Pure Manila Rope is unequalled for durability, long service, and economical operation. That is *why* it is selected for use at the foremost dry docks, shipyards, and on board modern vessels where "first quality" is a pre-requisite.

The genuine Columbian can always be identified as "the Guaranteed Rope" by its red, white and blue *Tape-Marker* bearing the significant words "Guaranteed Rope, made by Columbian Rope Co., Auburn, N. Y." This marker is placed in one of the strands as a protection for both the buyer and manufacturer. Look for it when making your next purchase of rope.

Jobbers and Dealers:- It pays the mariner to use Columbian, and it pays *you* to sell it to him. Write today for catalogue and price list.

By Invitation Member
Emblem of BUSINESS CHARACTER
Rice Leaders of the World Association
Represents High Standing in NAME - PRODUCT - POLICY

Columbian Rope Company

332-90 Genesee Street

Auburn, *"The Cordage City"* N. Y.

Branches— New York Chicago Boston Houston

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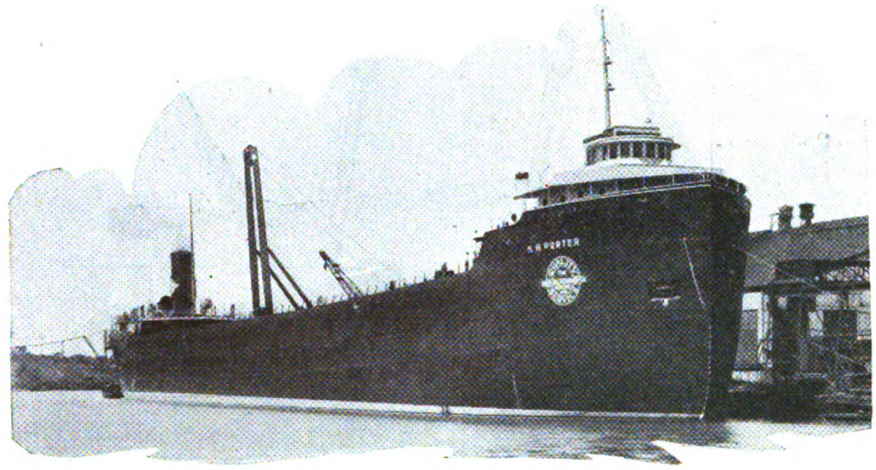
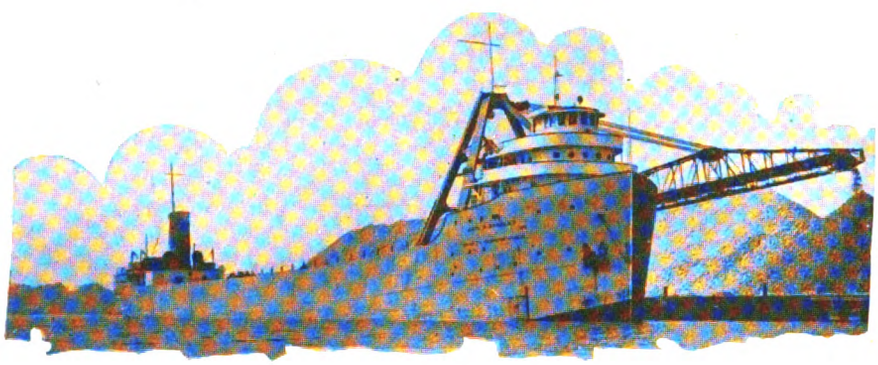
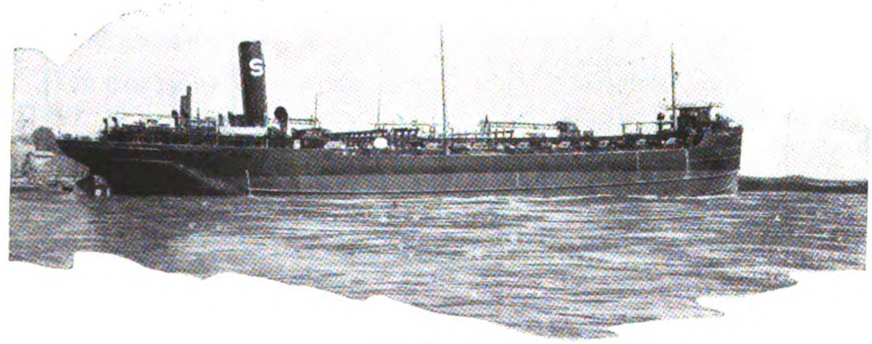
The American Comp



Bulk Freighter
"H. H. PORTER"



Self Unloading Bulk Freighter
"CARL D. BRADLEY"

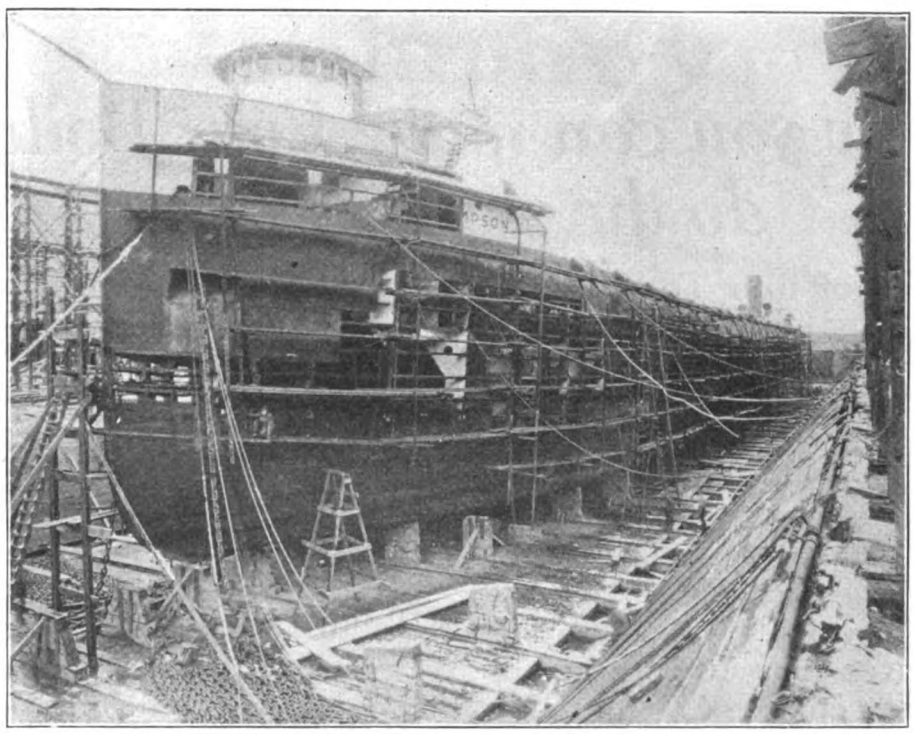


Oil Tanker
"W. P. COWAN"

These illustrations represent three of the different types of Lake Cargo Freighters which have been built by this Company in the past few years.

CONSTRUCTION PLANTS
AT
DETROIT, MICH.
WYANDOTTE, MICH.
CLEVELAND, OHIO
LORAIN, OHIO

Ship Building pany



Dry Dock Job—Lorain, Ohio

OUR REPAIR FACILITIES

13 MODERN DRY DOCKS — Four located at Buffalo, Chicago, Lorain, and Superior, capable of docking 600 foot type ships.

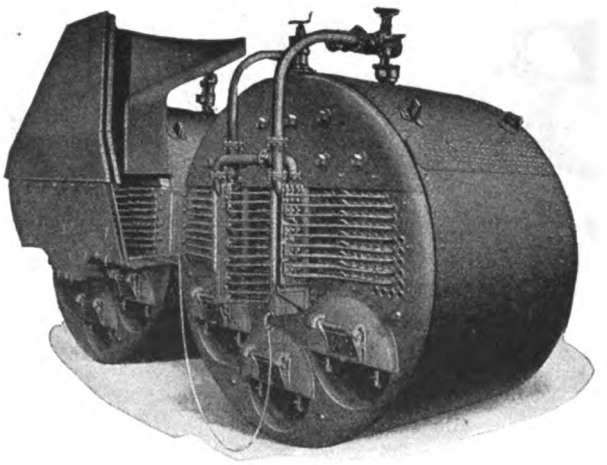
MOST MODERN EQUIPMENT for repairing, re-conditioning and reconstruction of ships always at your service.

REPAIR SCOW SERVICE AT ALL TERMINAL PLANTS— This feature makes it unnecessary to move vessels to our yards for minor repairs which can be made while ship is being loaded or unloaded. Scows are equipped with large Air Compressors, Electric and Acetylene Welding Apparatus. Scows at our Superior, Cleveland and Buffalo plants are equipped with 10-ton Steam Derricks in addition to above equipment.

Repair plants at

Cleveland, O.	Lorain, O.	Detroit, Mich.	Buffalo, N. Y.
Chicago, Ill.	Wyandotte, Mich.	Milwaukee, Wis.	Superior, Wis.

General Office, Foot of W. 54th St., Cleveland, Ohio



How you can make Four Boilers do the work of Five

A BATTERY of four Todd Elesco Superheater Boilers replaces five boilers in which superheater equipment is not included.

That is not a guess. It's a fact. We figure it on that basis when an owner gets tired of wasting one-fifth of all his coal and orders Superheaters installed while his ship's in port.

Get these figures. The saving in coal runs better than 10% for quadruple expansion engines, 12% for triple expansion engines, and 18% in compound engines using Todd Elesco Superheater equipment, as against the cylinder condensation losses which go with the old-fashioned use of saturated steam.

There are close to 3000 vessels equipped with *Todd Elesco Type Superheaters*—so our figures are based on a tonnage of over 3½ million indicated horse power.

With Todd Elesco Superheaters on oil burners you get such figures as .913 lbs. of oil per I.H.P. hour (S.S. Eastern Ocean); .921 lbs. of oil I.H.P. hour (Eastern Cloud); 11 knots per hour on 220 lbs. of oil in 24 hours (S.S. Robin Adair), and so on.

Todd Shipyards are in business to increase the efficiency of American shipping. This is one of our several economy gaining steam specialties.

If you want to know how to get more space for revenue cargoes, how to cut your coal bill about 20%, how to make four boilers do the work of five—ask us to send you full data on Todd Elesco Superheaters.

TODD
NEW YORK, U.S.A.

TODD ELESCO SUPERHEATERS

Licensed by The Superheater Company under Schmidt and other Patents

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McClelland, N. E., & Co., Ltd., 2 Stone St., New York, N. Y.

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Diamond Power Specialty Corp., Detroit, Mich.

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McClelland, N. E., & Co., Ltd., 2 Stone St., New York, N. Y.

BOILER CLEANING DEVICES
Geyser Boiler Appliance Co., 661 Atwater St., Detroit, Mich.

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Continental Iron Works, The, West and Calyar Sts., Brooklyn, N. Y.

BOILER RIVETS
Oliver Iron & Steel Co., 10th and Muriel Sts., Pittsburgh, Pa.
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BOILER STEAM AND WATER DRUMS (Welded)
Continental Iron Works, The, West and Calyer Sts., Brooklyn, N. Y.

BOILERS (Marine)
Almy Water Tube Boiler Co., 184 Allen St., Providence, R. I.
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Babcock & Wilcox Co., 85 Liberty St., New York.
Bethlehem Shipbuilding Corp., Ltd., Bethlehem, Pa.
Boiler & Equipment Supply Corp., 2 Rector St., New York, N. Y.
Fletcher, W. & A., Co., Hoboken, N. J.
Foster Marine Boiler Corp., 111 Broadway, New York City, N. Y.
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Babcock & Wilcox Co., The, 85 Liberty St., New York, N. Y.
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Copper & Brass Research Association, 25 Broadway, New York, N. Y.

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Boland & Cornelius, 1204 Prudential Bldg., Buffalo, N. Y.
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Copper and Brass Research Ass'n, 25 Broadway, New York, N. Y.

BURNERS (Acetylene) — See TORCHES. BURNERS AND BRAZING OUTFITS (Acetylene, Blow, Oxy-Acetylene)

BURNERS (Oil Burning Equipment)
Babcock & Wilcox Co., The, 85 Liberty St., New York, N. Y.
Peabody Engineering Co., 110 East 42nd St., New York, N. Y.

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Columbian Rope Co., Auburn, N. Y.
Durable Wire Rope Co., 93 Pearl St., Boston, Mass.
National Malleable Castings Co., 10600 Quincy Ave., Cleveland, O.
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CALCIUM CARBIDE
Air Reduction Sales Co., 342 Madison Ave., New York.

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Robeson Preservo Co., Port Huron, Mich.

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American Engineering Co., Philadelphia, Pa.
Bethlehem Shipbuilding Corp., Ltd., Bethlehem, Pa.
Chase Mach. Co., The, 2313 Elm St. N. W., Cleveland, O.
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Mundy, J. S., Hoisting Engine Co., 722 Frelinghuysen Ave., Newark, N. J.
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Bethlehem Shipbuilding Corp., Ltd., Bethlehem, Pa.
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Columbian Bronze Corp., The, Freeport, L. I., New York.

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American Chain Co., 37 West 39th St., New York, N. Y.
National Malleable Castings Co., 10600 Quincy Ave., Cleveland, O.

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American Chain Co., 37 W. 39th St., New York, N. Y.
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CHAIN (Marine Railway)
National Malleable Castings Co., The, 10600 Quincy Ave., Cleveland, O.

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American Chain Co.,
37 W. 39th St., New York, N. Y.
Woodhouse Chain Works,
Third & Schenck Sts., Trenton, N. J

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American Chain Co.,
37 W. 39th St., New York, N. Y.
Woodhouse Chain Works,
Third & Schenck Sts., Trenton, N. J

CHAINS (Stud Link)
American Chain Co.,
37 W. 39th St., New York, N. Y.
National Malleable Castings Co., The,
10600 Quincy Ave., Cleveland, O.
Woodhouse Chain Works,
Third & Schenck Sts., Trenton, N. J.

CHAIN (Wrecking)
National Malleable Castings Co., The,
10600 Quincy Ave., Cleveland, O.

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American Engineering Co.,
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25 Broadway, New York, N. Y.
Hungerford, U. T., Brass & Copper Co.,
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Hussey, C. G., & Co., Pittsburgh, Pa.
Michigan Copper & Brass Co., Detroit, Mich.
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CYLINDERS (Acetylene)—See ACETYLENE IN CYLINDERS

CYLINDERS (Oxygen—See OXYGEN IN CYLINDERS

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Superior Iron Works Co., Superior, Wis.

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Toledo Ship Building Co., Toledo, O.

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Marine Decking & Supply Co.,
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Westinghouse Electric & Mfg. Co.,
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220 Ohio St., Buffalo, N. Y.

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General Electric Co., Schenectady, N. Y.

FLOOD LIGHT PROJECTORS—See PROJECTORS (Electric Flood Light)

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Air Reduction Sales Co.,
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Oliver Iron & Steel Co.,
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American Shipbuilding Co., Cleveland, O.
Mead-Morrison Mfg. Co.,
149 Broadway, New York City, N. Y.
Todd Shipyards Corp.,
25 Broadway, New York City.

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Continental Iron Works., The,
West and Calyer Sts., Brooklyn, N. Y.

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General Electric Co., Schenectady, N. Y.

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American Steam Gauge & Valve Mfg. Co
Camden St., Boston, Mass.

GAS PRODUCERS
Air Reduction Sales Co.,
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Westinghouse Electric & Mfg. Co.,
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American Balsa Co., Inc.,
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General Electric Co., Schenectady, N. Y.

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Mead-Morrison Mfg. Co.,
149 Broadway, New York City, N. Y.
Mundy, J. S., Hoisting Engine Co.,
722 Frelinghuysen Ave., Newark, N. J.
Superior Iron Works Co., Superior, Wis.

HOISTING AND TRANSMISSION ROPE (Manilla)
Whitlock Cordage Co., New York, N. Y.

HOISTING EQUIPMENT (Ash)
American Engineering Co.,
Cumberland & Aramingo Sts., Philadelphia, Pa.
Mead-Morrison Mfg. Co.,
149 Broadway, New York City, N. Y.
Mundy, J. S., Hoisting Engine Co.,
722 Frelinghuysen Ave., Newark, N. J.
Superior Iron Works Co., Superior, Wis.

HOISTS (Air)
American Ship Building Co., Cleveland, O.
Boston & Lockport Block Co.,
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General Electric Co., Schenectady, N. Y.
Great Lakes Engineering Works,
River Rouge, Mich.
Ingersoll-Rand Co.,
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American Engineering Co.,
Cumberland & Aramingo Sts., Philadelphia, Pa.
Mead-Morrison Mfg. Co.,
149 Broadway, New York City, N. Y.
Superior Iron Works, Superior, Wis.

HOOKS (Releasing)
American Balsa Co., Inc.,
305 Vernon Ave., Long Island City, N. Y.

HOSE (Welding)
Air Reduction Sales Co.,
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Brunswick-Kroeschell Co.,
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Lidgerwood Mfg. Co.,
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Lidgerwood Mfg. Co.,
96 Liberty St., New York, N. Y.

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Fletcher, W. & A., Co., Hoboken, N. J.
Great Lakes Engineering Works,
River Rouge, Mich.
Manitowoc Ship Building Corp.,
Manitowoc, Wisc.
Superior Ship Building Co., Superior, Wis.
Toledo Ship Building Co., Toledo, O.

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American Shipbuilding Co., Cleveland, O.
Mead-Morrison Mfg. Co.,
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Todd Shipyards Corp.,
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MANILA OAKUM—See OAKUM (Marine Rope, Packings, plumbers)

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Lidgerwood Mfg. Co.,
96 Liberty St., New York.

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MARINE OIL—See OIL (Marine)

MARINE (Paint)
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101 Park Ave., New York, N. Y

MARINE RAILWAY BUILDERS
Crandall Engineering Co.,
102 Border St., Boston, Mass.

MARINE SUPPLIES
Carpenter, Geo. B., & Co.,
436 N. Wells St., Chicago, Ill.

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Robeson Preservo Co., Port Huron, Mich.

MOORING ENGINES
American Engineering Co.,
Cumberland & Aramingo Sts., Philadelphia, Pa.
Mead-Morrison Mfg. Co.,
149 Broadway, New York City, N. Y.

MOORING MACHINES
American Engineering Co.,
Cumberland & Aramingo Sts., Philadelphia, Pa.
Chase Machine Co., The,
2313 Elm St., N. W., Cleveland, O.
Mead-Morrison Mfg. Co.,
149 Broadway, New York City, N. Y.

MOTOR GENERATOR SETS
General Electric Co., Schenectady, N. Y.

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Engberg's Electric & Mechanical Co.,
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General Electric Co., Schenectady, N. Y.

MOTORS (Winch)
General Electric Co., Schenectady, N. Y.

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Carpenter, Geo. B., 436 N. Wells St., Chgo.
Ritchie, E. S., & Sons, Brookline, Mass.
Sperry Gyroscope Co., The,
Manhattan Bridge Plaza, Brooklyn, N. Y.

NAVIGATIONAL INSTRUMENT
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Air Reduction Sales Co.,
342 Madison Ave., New York.
Linde Air Products Co.,
30 E. 42nd St., N. Y. C.

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Hooven & Allison Co., The, Xenia, Ohio.
Stratford, Geo., Oakum Co.,
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Babcock & Wilcox Co., The,
85 Liberty St., New York, N. Y.
Bethlehem Shipbuilding Corp., Ltd.,
Bethlehem, Pa.
Peabody Engineering Co.,
110 East 42nd St., New York, N. Y.
White Fuel Oil Engineering Corp.,
25 Broadway, New York, N. Y.

OIL CUPS

Cook's Sons, Adam,
708 Washington St., New York
Lunkenheimer Co., The, Cincinnati, O.

OXY-ACETYLENE WELDING AND CUTTING—See WELDING AND CUTTING APPARATUS AND SUPPLIES (Oxy-Acetylene Process)

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Air Reduction Sales Co.,
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Marine Decking & Supply Co.,
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Otello & Bitmo Corp., The,
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Pantasote Company,
11 Broadway, New York City, N. Y.

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International Mercantile Marine Co.,
9 Broadway, New York, N. Y.
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PATENTS

Siggers & Siggers, Washington, D. C.

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Hanna, M. A., & Co., Cleveland, O.

PIPE BENDING MACHINERY—See MACHINERY (Pipe Bending)

PIPE (Iron and Steel)

Continental Iron Works, The,
West and Calyer Sts., Brooklyn, N. Y.

PLASTER FIBRE

Stratford, Geo., Oakum Co.,
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PLATES (Floor)

American Pressed Steel Co., Philadelphia, Pa.

PLUMBERS' OAKUM

Stratford, Geo., Oakum Co.,
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PROPELLER BLADES

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Sheriffs Mfg. Co., Milwaukee, Wis.

PROPELLER WHEELS

American Ship Building Co., Cleveland, O.
Detroit Ship Building Co., Detroit, Mich.
Great Lakes Engineering Works,
River Rouge, Mich.
Milwaukee Dry Dock Co., Milwaukee, Wis.
Sheriffs Mfg. Co., Milwaukee, Wis.
Toledo Ship Building Co., Toledo, O.
Trout, H. G., Company,
220 Ohio St., Buffalo, N. Y.

PROPELLERS

Bethlehem Shipbuilding Corp., Ltd.,
Bethlehem, Pa.
Columbian Bronze Corp.,
Freeport, L. I., New York.
Hyde Windlass Co., Water St., Bath, Me.

PUMPS

Boston & Lockport Block Co.,
E. Boston, Mass.
Bethlehem Shipbuilding Corp., Ltd.,
Bethlehem, Pa.
Great Lakes Engineering Works,
River Rouge, Mich.
Westinghouse Electric & Mfg. Co.,
E. Pittsburgh, Pa.

PUMPS (Boiler Feed)

Ingersoll-Rand Co.,
11 Broadway, New York, N. Y.
Superheater Co., The,
17 E. 42nd St., New York.

PUMPS (Diaphragm)

Boston & Lockport Block Co.,
123 Condor St., E. Boston, Mass.

PUMPS (Steam)

Ingersoll-Rand Co.,
11 Broadway, New York, N. Y.

PURIFICATION SYSTEMS—See WATER PURIFICATION SYSTEMS

PYROMETERS

The Superheater Co.,
17 E. 42nd St., New York City.

RADIO EQUIPMENT

Radio Corporation of America,
Woolworth Bldg., New York City

RAFTS

American Balsa Co., Inc.,
305 Vernon Ave., Long Island City, N. Y.

RAILWAY DRY DOCKS

Crandall Engineering Co., The,
102 Border St., Boston, Mass.

REFRIGERATING MACHINERY

Brunswick-Kroeschell Co.,
New Brunswick, N. J.
Great Lakes Engineering Works,
River Rouge, Mich.
Phoenix Ice Machine Co.,
2711 Church Ave., Cleveland, Ohio.
Westinghouse Electric & Mfg. Co.,
E. Pittsburgh, Pa.

RELEASING HOOK—See HOOKS (Releasing)

REPAIRS (Marine)

American Ship Building Co., Cleveland, O.
Bath Iron Works, Bath, Me.
Bethlehem Shipbuilding Corp., Ltd.,
Bethlehem, Pa.
Chicago Ship Building Co., So. Chicago, Ill.
Fletcher, W. & A., Co., Hoboken, N. J.
Great Lakes Engineering Works,
River Rouge, Mich.
Manitowoc Ship Building Corp.,
Manitowoc, Wisc.
Todd Shipyards Corp.,
25 Broadway, New York City.
Toledo Ship Bldg. Co., Toledo, O.

REVOLUTION COUNTERS

Cummings Machine Works,
110 High St., Boston, Mass.

RIVETS

Oliver Iron & Steel Co.,
10th and Muriel Sts., Pittsburgh, Pa.

RIVETS (Boiler)—See BOILER RIVETS

RIVETS (Ship)

Great Lakes Engineering Works,
River Rouge, Mich.

RIVETING HAMMERS (Pneumatic)

Ingersoll-Rand Co.,
11 Broadway, New York, N. Y.

ROPE (Manilla)

Columbian Rope Co., Auburn, N. Y.
Hooven & Allison Co., The, Xenia, Ohio.

ROPE (Manilla, Net, Sisal and Other Hard Fiber Cordage)

Columbian Rope Co., Auburn, N. Y.
Hooven & Allison Co., The, Xenia, Ohio.
Plymouth Cordage Co., North Plymouth, Mass.
Whitlock Cordage Co.,
46 South St., New York City.

ROPE (Braided Cotton)

Samson Cordage Works,
88 Broad St., Boston, Mass.

ROPE (Transmission)

Columbian Rope Co., Auburn, N. Y.
Hooven & Allison Co., The, Xenia, Ohio.
Whitlock Cordage Co.,
46 South St., New York City.

ROPE (Wire)—See WIRE ROPE

ROPE DRIVES AND TRAMWAYS

Whitlock Cordage Co.,
46 South St., New York City.

ROPE OAKUM

Stratford, Geo., Oakum Co.,
Jersey City, N. J.

SAILMAKERS

Taulane's, George, Sons,
324-26 S. Front St., Philadelphia, Pa.

SCHOONERS (Auxiliary)

American Ship Building Co., Cleveland, O.
Chicago Ship Building Co., So. Chicago, Ill.
Milwaukee Dry Dock Co., Milwaukee, Wis.
Todd Shipyards Corp.,
25 Broadway, New York City.
Toledo Ship Building Co., Toledo, O.

SEARCHLIGHTS (Incandescent and Arc)

General Electric Co., Schenectady, N. Y.
Sperry Gyroscope Co., The,
Manhattan Bridge Plaza, Brooklyn, N. Y.

SECOND HAND MACHINERY—See MACHINERY, SECOND HAND

SHAFTING (Propeller)

Columbian Bronze Corp., The,
Freeport, L. I., New York.

SHIPBUILDERS
American Ship Building Co., Cleveland, O.
Bethlehem Shipbuilding Corp., Bethlehem, Pa.
Fletcher, W. & A., Co., Hoboken, N. J.
Great Lakes Engineering Works, River Rouge, Mich.
Manitowoc Ship Building Corp., Manitowoc, Wisc.
Todd Shipyards Corp., 25 Broadway, New York City.
Toledo Ship Building Co., Toledo, O.

SHIP RIVETS—See RIVETS (Ship)

SHIP STABILIZERS
Sperry Gyroscope Co., The, Manhattan Bridge Plaza, Brooklyn, N. Y.

SPECIALTIES (Steam)
Lunkenheimer Co., The, Cincinnati, O.

SPUN OAKUM
Stratford, Geo., Oakum Co., Jersey City, N. J.

STEAMSHIP LINES (Passenger and Freight)
Cleveland & Buffalo Transit Co., East 9th St., Cleveland, O.
United American Lines, Inc., 39 Broadway, New York, N. Y.

STEEL BARGES
American Bridge Co., 71 Broadway, New York, N. Y.

STEEL TANKS
Brunswick-Kroeschell Co., New Brunswick, N. J.

STEERING ENGINES
Hyde Windlass Co., Water St., Bath, Me.
Mundy, J. S., Hoisting Engine Co., 722 Frelinghuysen Ave., Newark, N. J.
Superior Iron Works Co., Superior, Wis.

STEERING GEARS
American Engineering Co., Philadelphia, Pa.
American Ship Building Co., Cleveland, O.
Bethlehem Shipbuilding Corp., Ltd., Bethlehem, Pa.
Lidgerwood Mfg. Co., 96 Liberty St., New York.
Mead-Morrison Mfg. Co., 149 Broadway, New York City, N. Y.
Superior Iron Works Co., Superior, Wis.

STEVEDORES
East River Stevedoring Corp., 39 Broadway, New York, N. Y.

STRUCTURAL RIVETS—See RIVETS (Structural)

SUPERHEATERS (Marine)
Power Specialty Co., 111 Broadway, New York City.
The Superheater Co., 17 E. 42nd St., New York City.

SWITCHBOARDS
General Electric Co., Schenectady, N. Y.

TACKING LINES (Manila)
Plymouth Cordage Co., North Plymouth, Mass.

TANK RIVETS—See RIVETS (Tank)

TANKS (Acetylene)
Linde Air Products Co., 30 E. 42nd St., New York City.
Prest-O-Lite Co., Inc., 30 E. 42nd St., New York City.

TANKS (Riveted)
Bath Iron Works, Bath, Me.
Lake Erie Boiler Works, Buffalo, N. Y.

TANKS (Welded Steel)
Continental Iron Works, The, West and Calyer Sts., Brooklyn, N. Y.

TARRED FITTINGS
Hooven & Allison Co., The, Xenia, Ohio.

TARRED ROPE OAKUM
Stratford, Geo., Oakum Co., Jersey City, N. J.

TELEMOTORS (Electric)
American Engineering Co., Philadelphia, Pa.
Mead-Morrison Mfg. Co., 149 Broadway, New York City, N. Y.

TELEMOTORS (Hydraulic)
American Engineering Co., Cumberland & Aramingo Sts., Philadelphia, Pa.
Mead-Morrison Mfg. Co., 149 Broadway, New York City, N. Y.

THERMOMETERS
Tagliabue, G., 302 Pearl St., New York, N. Y.

TICKETS FOR EUROPE
International Mercantile Marine Co., 9 Broadway, New York.

TORCHES, BURNERS, AND BRAZING OUTFITS (Acetylene, Blow, Oxy-Acetylene)
Air Reduction Sales Co., 342 Madison Ave., New York
Penberthy Injector Co., Detroit, Mich.

TORCHES (Welding and Cutting)
Air Reduction Sales Co., 342 Madison Ave., New York.

TORSION METERS
Cummings Machine Works, 110 High St., Boston, Mass.

TOWING LINES (Manila)
Whitlock Cordage Co., 46 South St., New York City.

TOWING MACHINES
American Engrg. Co., Philadelphia, Pa.
Mead-Morrison Mfg. Co., 149 Broadway, New York City, N. Y.

TRANSMISSION (Rope)—See ROPE (Transmission)

TURBINES
Fletcher, W. & A., Co., 12th to 14th St., Hoboken, N. J.

TUBING (Brass and Copper)
Scovill Mfg. Co., Waterbury, Conn.

TURBINES (Electrical)
General Electric Co., Schenectady, N. Y.

TURBINES (Marine)
Bethlehem Shipbuilding Corp., Ltd., Bethlehem, Pa.

TURBINES (Steam)
Westinghouse Electric & Mfg. Co., E. Pittsburgh, Pa.

TWINE AND ROPE
Columbian Rope Co., Auburn, N. Y.
Hooven & Allison Co., The, Xenia, Ohio.
Plymouth Cordage Co., North Plymouth, Mass.

UNTARRED ROPE OAKUM
Stratford, Geo., Oakum Co., Jersey City, N. J.

VALVES AND FITTINGS
Bethlehem Shipbuilding Corp., Ltd., Bethlehem, Pa.
Lunkenheimer Co., The, Cincinnati, O.
Penberthy Injector Co., Detroit, Mich.
Powell, Wm., The, Spring Grove Ave., Cincinnati, O.

VALVE RESEATING MACHINES
Leavitt Machine Co., The, Orange, Mass.

WALKAWAY GRATINGS—See GRATINGS (for Floors, Walkaways, etc.)

WAREHOUSE FACILITIES
Port of Newark, City Hall, Newark, N. J.

WATERPROOFING CANVAS
Robeson Preservo Co., Port Huron, Mich.

WELDERS (Electric Arc)
Westinghouse Electric & Mfg. Co., E. Pittsburgh, Pa.

WELDING (Custom)
Linde Air Products Co., 42nd St. Bldg., New York City.
Oxweld Acetylene Co., Newark, N. J.

WELDING AND CUTTING APPARATUS AND SUPPLIES (Oxy-Acetylene Process)
Air Reduction Sales Co., 342 Madison Ave., New York.
Prest-O-Lite Co., Inc., 30 E. 42nd St., New York City.

WELDING AND CUTTING MACHINES (Oxy-Acetylene)
Air Reduction Sales Co., 342 Madison Ave., New York, N. Y.

WELDING GLASSES
Air Reduction Sales Co., 342 Madison Ave., New York.

WELDING RODS
Air Reduction Sales Co., 342 Madison Ave., New York.
Prest-O-Lite Co., Inc., 30 E. 42nd St., New York City.

WHISTLES
Lunkenheimer Co., The, Cincinnati, O.

WINCHES
American Balsa Co., Inc., 305 Vernon Ave., Long Island City, N. Y.
American Engineering Co., Philadelphia, Pa.
Bethlehem Shipbuiding Corp., Ltd., Bethlehem, Pa.
Hadfield-Penfield Steel Co., The, Bucyrus, Ohio.
Hyde Windlass Co., Water St., Bath, Me.
Lidgerwood Mfg. Co., 96 Liberty St., New York City.
Mead-Morrison Mfg. Co., 149 Broadway, New York City, N. Y.
Mundy, J. S., Hoisting Engine Co., 722 Frelinghuysen Ave., Newark, N. J.
Superior Iron Works, Superior, Wis.

WINDLASSES
American Engineering Co., Philadelphia, Pa.
American Ship Building Co., Cleveland, O.
Bethlehem Shipbuilding Corp., Ltd., Bethlehem, Pa.
Carpenter, Geo. B., & Co., 436 N. Wells, Chicago.
Hadfield-Penfield Steel Co., The, Bucyrus, O.
Hyde Windlass Co., Water St., Bath, Me.
Lidgerwood Mfg. Co., 96 Liberty St., New York.
Mead-Morrison Mfg. Co., 149 Broadway, New York City, N. Y.
Superior Iron Works, Superior, Wis.

WIRE AND WIRING DEVICES
General Electric Co., Schenectady, N. Y.

WIRE ROPE
Durable Wire Rope Co., 93 Pearl St., Boston, Mass.

WIRELESS SETS AND APPARATUS
Radio Corp. of America, Woolworth Bldg., New York City.

WOOD BORING MACHINES—See MACHINERY (Wood Boring Pneumatic)

YACHT ROPE
Plymouth Cordage Co., North Plymouth, Mass.
Whitlock Cordage Co., 46 South St., New York City.

SHIPS PORT DIRECTORY

—NEW YORK—

Forwarding & Warehouse
Williams Shipping Agency, Inc.
59 Pearl St., New York, N. Y.
Broad 622

Freight Forwarding
National Shipping Co. Inc.,
24 Stone St., New York City
Cable: Nashico Phone: Broad 1452

—NEW YORK—

Life Preservers
NATIONAL LIFE PRESERVER CO.
"Ever-Warm Safety-Suit"
11 Broadway, New York, N. Y.
Tel: Bowling Green 8609-8775

Paint
NEW JERSEY PAINT WORKS
Harry Louderbough, Inc.
Wayne & Fremont Sts.
Jersey City, N. J. Montgomery 165 and 166

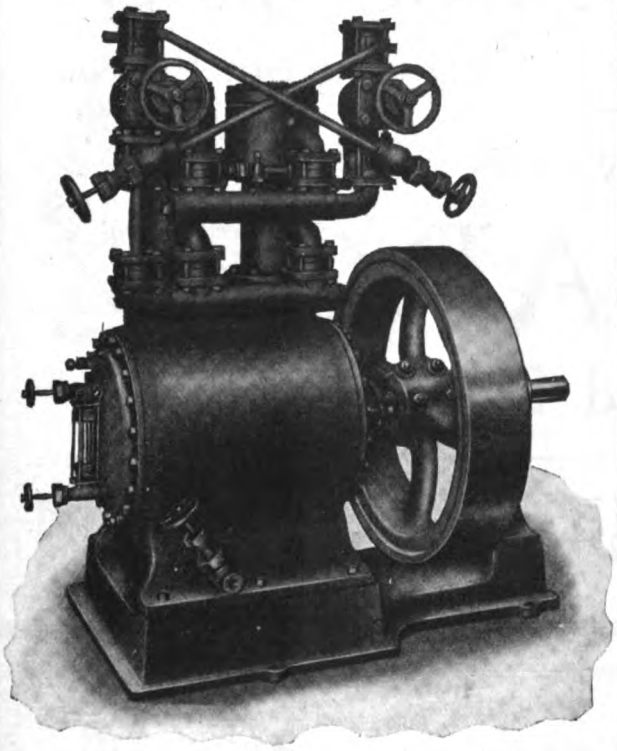
—NEW YORK—

Stevedore
East River Stevedoring Corp.
39 Broadway, New York, N. Y.
Whitehall 780

—PHILADELPHIA—

Sailmakers
GEORGE TAULANE'S SONS
324-326 So. Front St.
Philadelphia, Pa.

BRUNSWICK-KROESCHELL EQUIPMENT



THE LOGICAL CHOICE

The reason why practically all of the Great Lakes passenger steamers and freighters, using mechanical refrigeration, are equipped with **Brunswick-Kroeschell** machines is because the **Brunswick-Kroeschell** System of Refrigeration has never failed to give safe, uninterrupted service at minimum cost.

Actual records of service show that **Brunswick-Kroeschell** Equipment gives lower operating cost than any other refrigerating system you could use.

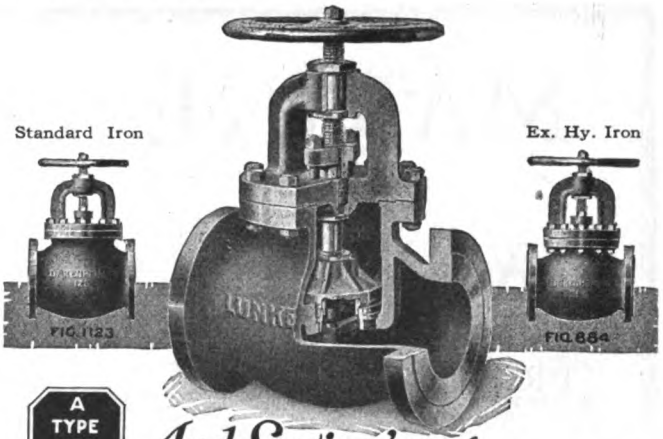
Moreover, there is a **Brunswick-Kroeschell** machine uniquely suited to your needs.

Write for descriptive literature and list of ships now equipped with **Brunswick-Kroeschell** machines.

BRUNSWICK-KROESCHELL COMPANY
Dept. 13

New Brunswick, N. J.
200-290 Jersey Ave.

Chicago, Ill.
440-472 West Erie St.



A TYPE FOR EVERY PURPOSE

And Service 'way beyond the average!

Be it a small size water or oil line, or the large size high pressure and high temperature steam line, there is a Lunkenheimer Valve especially suited to the purpose. Every type is designed to give maximum service under extreme operating conditions, and with the line complete, standardization with its many advantages, is easily accomplished.

With seating surfaces regrindable and all parts made to gauge and renewable, repairs can easily be made should necessity require. The installation of Lunkenheimer Valves means permanence in the line, with maintenance expense reduced to a minimum.

Our catalog No. 58-FH illustrates and describes the various types in detail. Shall we send you a copy?

Fig. 1021
"Ferrenewo" Iron Body, Renewable "Valve-Nickel" Seat and Disc

Fig. 73
"Renewo" Bronze Body, Renewable "Valve-Nickel" Seat and Disc

Fig. 606
Cast-Steel

"America's Best since 1862"

THE LUNKENHEIMER CO.
"QUALITY"

LARGEST MANUFACTURERS OF
HIGH GRADE ENGINEERING SPECIALTIES
IN THE WORLD

NEW YORK CHICAGO **CINCINNATI, U. S. A.** BOSTON LONDON

EXPORT DEPT. 129-135 LAFAYETTE ST., NEW YORK

1300-20M-68

LUNKENHEIMER

Please mention MARINE REVIEW *when writing to Advertisers*

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Help and Positions Wanted—For Sale and Miscellaneous

"Help Wanted" Advertisements
6c per word—minimum advertisement—$3.00
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"For Sale and Miscellaneous" Advertisements
10c per word—minimum advertisement—$3.00
All capitals—15c a word—minimum $4.50

Seven (7) words must be added for box address.

To insure insertion, advertisements must reach us by the 9th of the month.

Please have remittance accompany order.

For Sale

FOR SALE:—WRECKED STEAMER
Frank Stevens. 150′ hull, 10 x 12 Scotch boiler built by Kingsford Boiler Works, Oswego, N. Y. Perfect condition, age 6 years, used only 3 years. 156-3″ tubes, 150 lbs. steam pressure, complete pot valve engine. Hull could be used for dock. Now located at Ashtabula, Ohio, harbor. Will sacrifice for immediate sale. Phone or write J. B. Dworken (owner), 613 Schofield Bldg., Cleveland, O. Main 5377.

FOR CHARTER
LARGE BARGE, 264 ft. long, 53 ft. beam, with 50 ft. derricks fore and aft. Has great storage and handling capacity, and would serve either as a floating warehouse or in transferring cargoes. Now lying in River Rouge.
UNITED FUEL & SUPPLY COMPANY,
Free Press Bldg., Detroit.

FOR SALE:—50′ X 14′ 6″ HARBOR TUG
or Supply Boat, with two cyylinder 45 horse Gulowsen-Grei Crude Oil Engine, Joes clutch and electric starting device. Separate engine, with air compressor. Boat fully equipped and ready for work. Boat, engine and equipment new 1921. Will sell for one-half of actual cost. Also one large size Pentwater lifter, with twin oscillating cylinders for steam, Kriebel make. Used only one season. Frank J. Albright Company, LaPointe, Wisconsin.

FOR SALE:—ONE WOODEN TUG
equipped with 8″ sand pump. Completely equipped and in first class condition. Bargain. Write for particulars. Address Box 335, MARINE REVIEW, Cleveland, O.

FOR SALE:—800 CUBIC YARD DER-
rick Scow. Wood and Steel construction. Completely equipped. Just built. Address Box 334, MARINE REVIEW, Cleveland, O.

For Sale

FOR SALE

Complete outfit of British Manufacture, built to Lloyds classification:

13½ x 10½ 3 furnace SCOTCH BOILER with UPTAKE, STACK and all FITTINGS.

14-22-36 x 24 TRIPLE EXPANSION ENGINE with SURFACE CONDENSER, AIR, CIRCULATING, FEED and BILGE PUMPS, THRUST, INTERMEDIATE and TAIL SHAFTS, PROPELLER WHEEL with spare blades. ELECTRIC LIGHT PLANT.

MARVIN BRIGGS, INC.,
167 Sixth St., Brooklyn, N. Y.

FOR SALE:—ONE 45 H.P. 3 CYLINDER
Meitz oil engine, rebuilt, with complete outfit, cheap. P. J. Fritsch, 30 Isabella St., Boston, Mass.

AMERICAN TRANSPORTATION CO.
(in liquidation)
WILL OFFER THEIR STEAMERS
ROBERT M. THOMPSON and RUBY
(Sistership, about 4000 tons d.w. built 1912)
For Sale at Public Auction
at 12 O'clock noon on December 7, 1922
at the Office of Messrs. Woodrow & Lewis
84-86 Pearl Street, New York City
For further information and particulars of steamers apply to
JAMES W. ELWELL & CO. INC., Agents
17 State St., New York City

FOR SALE:—ALL KINDS OF FLOATING
property. Also marine engines, boilers, etc. Rafailovich & Company, 26 Cortlandt Street, New York.

For Sale

FOR SALE:—MODACA SIREN WHISTLE.
Size of bell 3 x 9, with 1 inch steam connection. Price $50.00. Cost new $75.00. T. W. Vaughan, 163 Lincoln St., Manistee, Mich.

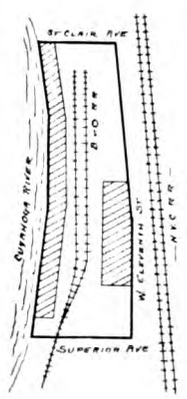
FOR SALE:—NEW 3500 TON FLOATING
Dry Dock. Price reasonable. For full particulars regarding price, etc., write Liberty Dry Dock & Repair Co., 16 Bridge Street, New York City.

Wanted

WANTED
Steel lighter with 350 H.P.—500 tons d.w. capacity. Around 120 x 34 ft.
One Hull for use as coal lighter; 500 tons cap.
Iron or Steel hull in good condition for conversion into a sand sucker.

FOR SALE
Wooden steamer, good condition. 850 M ft lbr; 1200 tons coal.
Tow Barge—232 x 26 x 12. 45,000 bu corn; 1400 tons coal.
Double deck passenger steamer; 236 passengers. Can carry 60 tons freight. 86 x 21½. Bargain.
Spar Deck, canal size, steel freighter.
Schooner, 125 x 26. Cheap.
Moon turbine generator for tug.
Four masted schooner; 900 M lbr; 2000 tons coal.
Single engine; 8″ x 10″.
F & A cmpd eng; 10″ & 18″ x 14″.
CHICAGO STEAMBOAT EXCHANGE
350 North Clark St., Chicago.

WANTED TO BUY:—STEEL TOWING
Tug for Lake service. Dimensions to be at least 100′ x 24′ x 12′ 6″. Must have from 600 to 800 H.P. and large capacity boiler. Send particulars. Address Box 333, MARINE REVIEW, Cleveland, O.



FOR SALE

Water and Rail Terminal in Cleveland

Dock Sheds, Warehouse Private R. R. Switches

Nearly 1½ acres land, on two main streets nearest to Public Square, new Union Station and Wholesale District.

V.C. Taylor & Son
Williamson Bldg.
Cleveland, Ohio

"How Wooden Ships Are Built"

By H. COLE ESTEP

A book packed full of useful information for the busy practical shipbuilder.

Every new method of construction shown in 188 big easy-to-see illustrations.

A complete story which takes the reader through every step of shipbuilding, beginning with the standing tree and ending with the trial ship with a supplement to laying off.

Price $3.00, Postpaid

THE PENTON PUBLISHING CO.
Book Department
Penton Bldg. Cleveland, O.
426 M

Who wants these boats?

MARINE EQUIPMENT

Floating Equipment located in The Philippines and Alaska is offered for sale by sealed bid on December 20th.

THERE are 22 boats in all, consisting of Gasoline and Steam Launches, a Yacht, Transport, Barge, two Yawls, two Sub-Chasers and two Distribution Barks. Seven of these boats are in poor condition, but the remainder are in fair or serviceable condition. This equipment is located and designated as follows:

At Manila, P. I.

Steam Launch, "Chicago," length 85', wood; Steam Launch, "New Orleans," length 86', wood; Steam Launch, "Peterson," length 57' 4", wood; Gasoline Launch, "Hugh McGrath," length 35', wood; Steam Yacht, "El Aquila," 185', steel; Steam Launch, "Louisville," length 72', wood; Steam Launch, "Reilly," length 78', wood; Army Transport, "Warren," length 370' 7", steel; Steam Launch, "Bangor," length 84', wood; Steam Launch, "Florida," length 71' 6", wood; Steam Launch, "Missoula," length 86', wood; Steam Launch, "Rochester" length 69', wood; Sub-Chaser, V-11, length 110', wood.

At Honolulu, H. T.

Gasoline Mine Yawls, M-220 and M-221, length 24', wood; Sub-Chaser, V-10, length 110', wood; Distribution Boats, L-5 and L-6, gasoline motors, length 32', wood.

At Valdez, Alaska

Harbor Boat, "Lieut. C. V. Donaldson," length 62', wood, equipped with 1 Marine fore and aft compound engine; Barge, capacity 30 tons, wood.

At Ft. Gibbons, Alaska

Gasoline Launch, "Walter H. Rodney," length 20', wood.

At Ft. St. Michael, Alaska

Wood Lighter, length 45', wood.

Circular proposal gives complete specifications and all terms of sale. Same can be obtained at either of the addresses below, where bids will also be opened. The Government reserves the right to reject any or all bids.

Western Surplus Property Control Officer, Fort Mason, Cal.

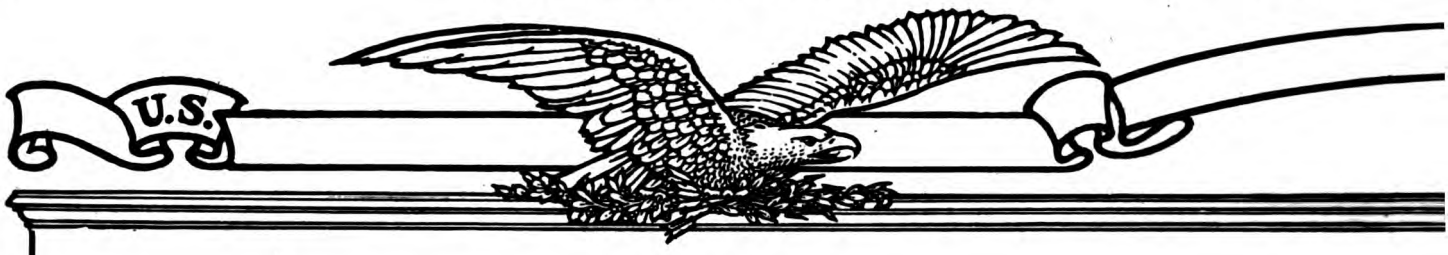
Commanding Officer, Q. M. Intermediate Depot, Seattle, Wash.

Commanding Officer, Philippine Q. M. Area Depot, Manila, P. I.

Commanding Officer, Honolulu Q. M. Area Depot, Honolulu, H. T.

Assistant Surplus Property Officer, where boats are located.

WAR DEPARTMENT



Marks are

At New Cumberland, Pa.
December 8.

Harness, all kinds
Aparejos, cargo
Bags, saddle, grain, feed
Bits, bridoon, curb, rein
Saddle Blankets
Horse Covers
Bridles and Collars
Currycombs and Brushes
Halters and Ties
Traces and Straps
Saddles, various

At Columbus, Ohio
December 12.

Motors, 5 to 50 h. p.
Lamp Shades, metallic
Transformers, G. E. & Mahoney
Terry Steam Turbine, 140 h. p.
Controllers, 220 volts
Boiler Tubes, 4" test 1000 lbs.
Steel, bar, strip, sheet, cold and hot rolled
Grinding Wheels, various
Rivets, assorted
Feed Bags, new
Jersey Gloves
Haversacks, various
Mittens, 1-finger lea.
Bees Wax and Clarified
Shoemaker's Thread, asstd.
Lasts, various
Table Cutlery
Stock Pots and Bake Pans
Boiling Plates
Razors, common
Shovels, intrenching
Cans, G. I., various
First Aid Packets
Cartridge Boxes
Hooks, assorted
Stovepipe and Joints
Wagon Bows and Bottoms
Wood Feed Boxes
Driver's Seats
Wagon Sides and Tongues
Wheels, front and hind
Harness components
Collars
Halters

At Philadelphia
December 15.

Rope, all kinds
Cutting Steels, all kinds
Sheared Tin, 22 gauge
Gauntlet Gloves
Bobbinette, grey, 48 to 72"
Unbleached Braid
Convalescent Cloth, grey
Cap Cloth, O. D.
Puttee Cloth, O. D.
Duck, various shades and wgts.
Melton, O. D., 8 to 28 oz.
Shirting, cot. and flan., O. D.
Thread, asstd.
Buckets, G. I., w/ covers
National Cash Registers
Canned Pears
Peaches
Pineapple
Apricots
Cherries
Asparagus
Raspberries
Dental Cream
Cigars
Shoe Polish

WAR DEP

Easy Money

—when you use them in such cases as these

SOMEWHERE in these lists you are going to come upon a familiar word. Mark it! Use a red, black, blue or green pencil—but mark that word, and mark it so it sticks out like a lighthouse! That word is the name of something you use in your business, and behind it stands a vast quantity of goods that can be purchased at a vast saving in these three War Department auctions.

Careful search through these lists will reveal many such words — each and every one packed full of profit opportunities for you. Mark them all! Take as much time as you need to comb the lists thoroughly! The busier you are, the more it will pay you to miss not a single item.

Other commodities, in profusion, are shown in the catalogs. Perhaps many would interest you as much as those listed here. Request to the Quartermaster Supply Officer, 1st. Ave. & 59th. St., Brooklyn, N. Y., will bring the New Cumberland and Philadelphia auction catalogs promptly. The Quartermaster Supply Officer, 1819 W. Pershing Rd., Chicago, Ill., will be equally glad to send you a catalog of the Columbus auction. The Government reserves the right to reject any or all bids.

ARTMENT

Index to Advertisements

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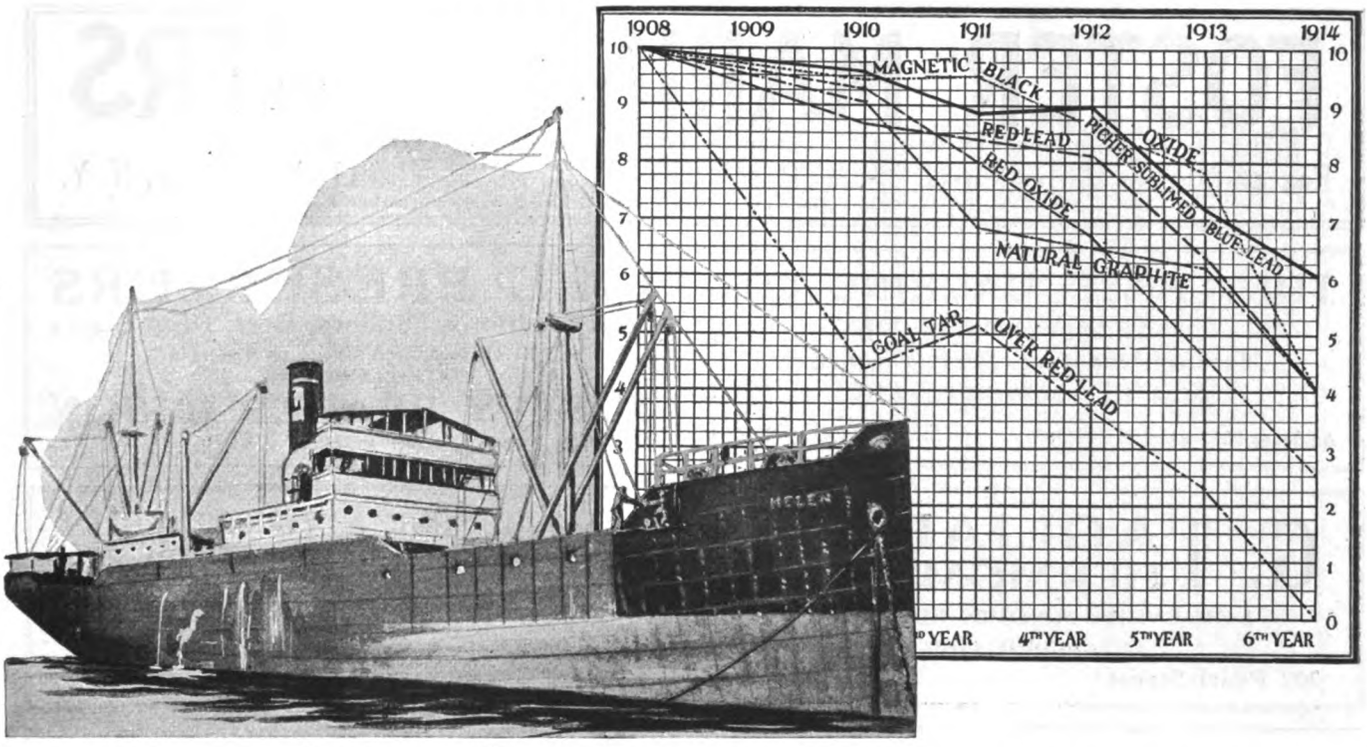

RUST

A vital problem to shipping men

DOES *painting* adequately protect metal against *rust?* How long should such protection endure without repainting? Has any one paint proved its superior efficiency and economy as a rust preventive? If so, what is that paint? These are questions of vital importance to every man interested in the construction and maintenance of shipping. And they are questions which the data presented in the above curves go far toward answering.

In 1908 the American Society for Testing Materials set up at Atlantic City 300 steel plates mounted as the panels of a fence. These panels were then carefully painted, respectively, with three coats of 50 varieties of paint; each paint being thus represented by an average of six specimen panels.

At the end of five years of exposure to the corroding influences of ocean winds and storms, it was found that only on 23 panels the paint still afforded appreciable protection to the metal. These 23 panels were then removed from that location and set up at the end of Young's "Million Dollar" Pier, where they were left exposed for another year.

The panels were then again examined, their condition noted, and appraisal made of the relative protective value demonstrated by the paints with which the surviving panels had been coated. The chart reproduced above records the comparative performances of the four commercial paints which were judged to have made the best showing. In rating these four paints, the figure 10 is assumed to represent theoretical perfection in an absolutely non-deteriorating rust-preventing paint.

A study of this chart clearly indicates that PICHER SUBLIMED BLUE LEAD leads other commercial pigments as a rust preventive. In fact, as the chart shows, the general condition of the panels protected by PICHER SUBLIMED BLUE LEAD was adjudged to be better at the end of six years' exposure, than was that of several of the other pigments at the end of five years.

Every buyer and user of metal protective paints should acquaint himself with the many advantages of PICHER SUBLIMED BLUE LEAD in application and service. Write for our booklet "Buying Rust Protection".

THE EAGLE-PICHER LEAD COMPANY
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PICHER
ESTABLISHED 1843

Picher
SUBLIMED BLUE LEAD
What it is—What it does.

PICHER SUBLIMED BLUE LEAD is a "fume product"—made by subliming the lead ore, galena (lead sulphide) and collecting the fumes. The pigment thus produced is a slate gray powder, of impalpable fineness, which when mixed with pure linseed oil produces a paint of remarkable hiding power and exceptional brushing and spreading qualities, which will endure years of exposure in service, without cracking, checking or peeling. This pigment remains perfectly suspended in oil and will not harden in the container.

Low in first cost and of the highest efficiency in service, PICHER SUBLIMED BLUE LEAD will be found the best paint to use for all rust-proofing purposes.

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Cincinnati, New York, Philadelphia, Detroit, Pittsburgh, Cleveland, Joplin, St. Louis, Kansas City, Baltimore, Buffalo, Minneapolis, New Orleans

Picher Sublimed Blue Lead *in Oil*

90% of PURE blue lead ground in 10% of PURE raw linseed oil

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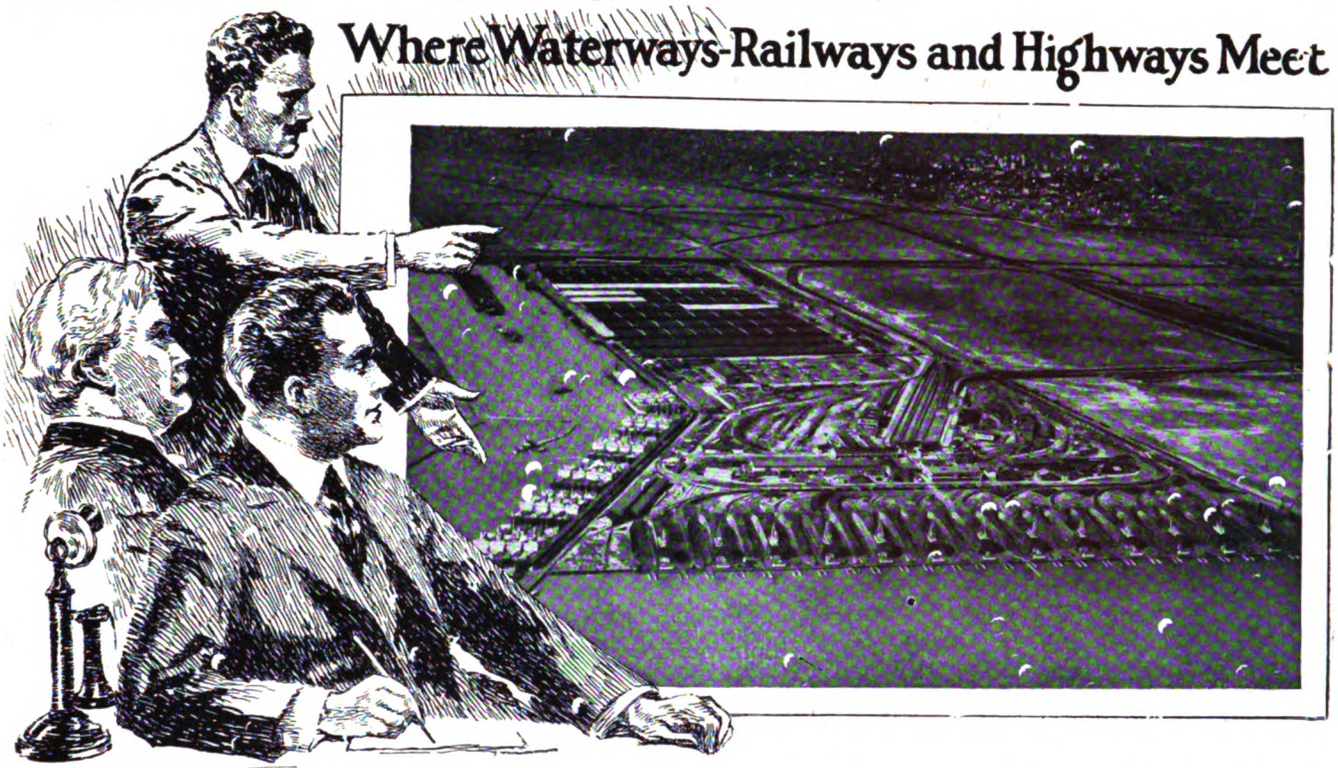

PORT NEWARK

THE MIRACLE OF MODERN TIMES

Most shipping and factory centers have grown up without planning. We see evidence of this during normal times in port congestion, in shortage of storage and loading and unloading facilities.

We also see factories located on expensive land, or too far from primary markets, or inconvenient for employees to reach and often lacking proper railway connections.

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Thomas L. Raymond, *Director*
Department of Public Improvements, City Hall, Newark, N. J.